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DEPARTMENT OF THE ARMY TECHNICAL MANUAL

11 624

OPERATION AND
ORGANIZATIONAL
FIELD AND DEPOT
MAINTENANCE

MASK, PROTECTIVE FIELD, M17

HEADQUARTERS, DEPARTMENT OF THE ARMY
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SECTION I

INTRODUCTION

1. Scope

a. This manual describes the M17 field protective mask and explains its use and method of functioning. It also provides instructions for the fitting, care and inspection, maintenance and repair, shipment, storage, and destruction of the masks to prevent enemy use.

b. Appendix I contains a list of current references. Appendix II contains the maintenance allocation chart. Appendix III is the basic issue items list.

2. Record and Report Forms

Forms listed below will be used in connection with the mask.

a. DA Form 9–81 (Exchange Part or Unit Identification Tag).

b. DA Form 468 (Unsatisfactory Equipment Report).

c. DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9).

d. DD Form 6 (Report of Damaged or Improper Shipment).

SECTION II

USE AND FUNCTIONING

3. Use

The M17 field protective mask (fig. 1) is a combat mask which protects the face, eyes, and respiratory tract of the wearer from field concentrations of CBR agents in the form of gases or aerosols. The mask does not afford protection against ammonia or carbon monoxide, nor is it effective in confined spaces where the oxygen content of the atmosphere is too low to sustain life (below 16 percent). Components of the M17 mask assembly include the mask, carrier, two lens outserts, and M1 antidim set.

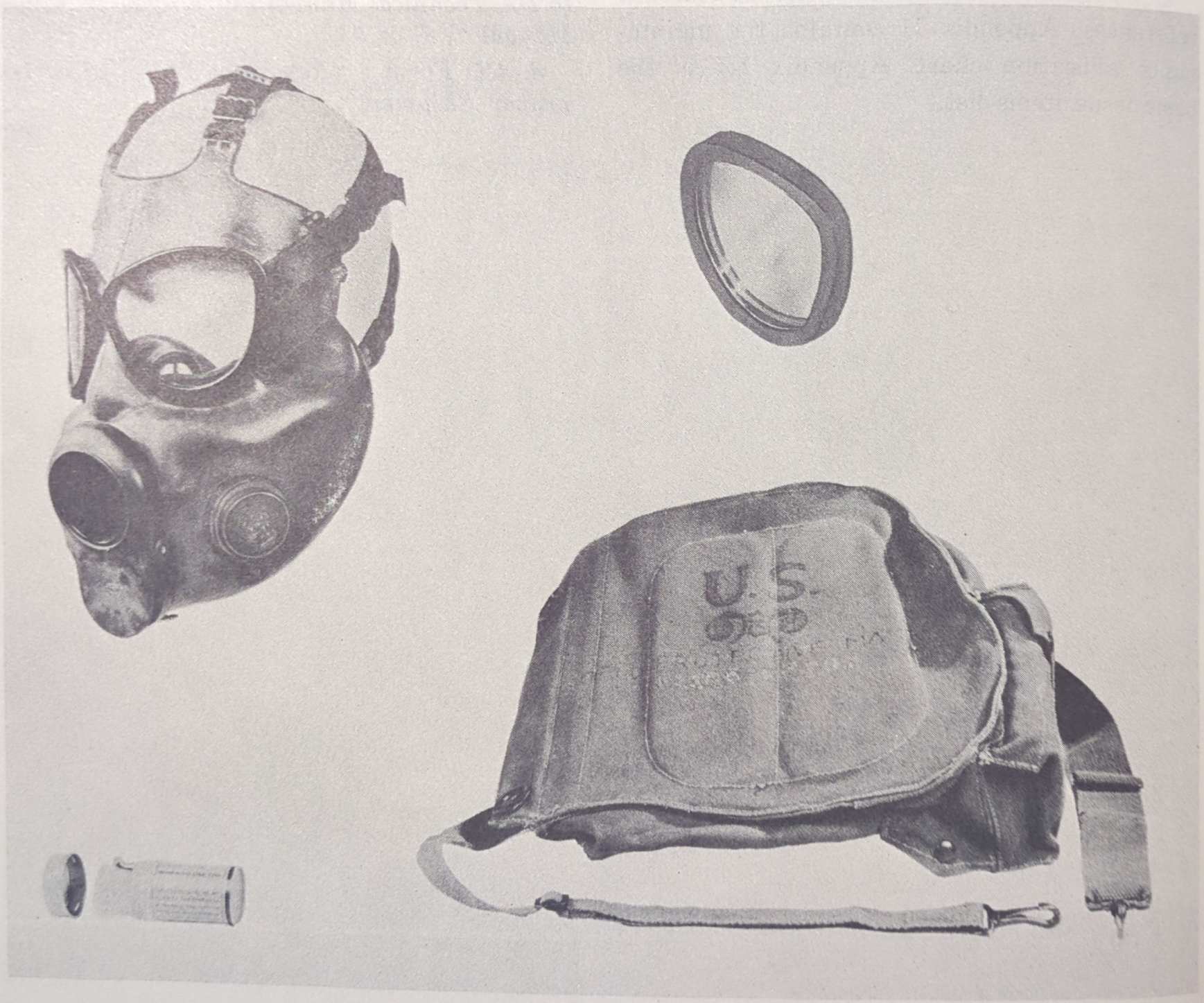


Figure 1. M17 field protective mask with detached outsert.

4. Functioning of Mask

(fig. 2)

When the wearer of an M17 field protective mask inhales, air is drawn into the facepiece through inlet valves and passes through filter elements (adsorptive pads) contained in pouches molded in the cheeks of the facepiece. The incoming filtered air passes from the cheek pouches through deflector tubes which direct the air across the lenses. The filtered air then passes through two one-way valves, one in each side of a nosecup. The wearer may breathe either through the nose or through the mouth. Exhaled air is discharged through an outlet valve at the chin position.

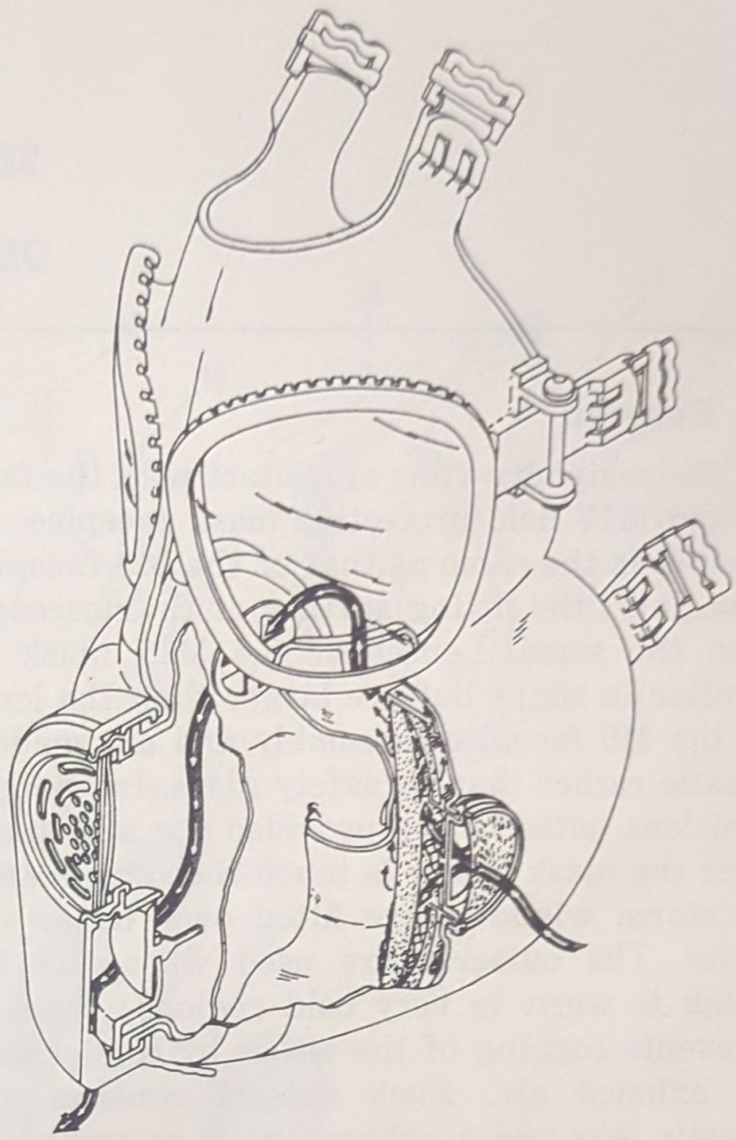


Figure 2. Airflow through mask.

SECTION III

DESCRIPTION

5. General

The periphery (line of contact with the face) of the M17 field protective mask facepiece assembly is the same as that of the M9 facepiece assembly; the fitting surface of the nosecup is also the same. Lenses of the M17 mask are similar in shape but are larger than the lenses in the M9 facepiece assembly and are made of plastic rather than of safety glass. In addition, two lens outserts are provided for attachment over the mask lenses in much the same manner as storm windows are fitted over house windows. The outserts are used when the M17 mask is worn in very cold regions; their use prevents fogging of the lenses by condensation of exhaled air. Each outsert consists of a plastic lens and a rubber apron assembly. The plastic lens, shaped to conform to the eyepiece over which it is to fit, is cemented in the narrower of two channels in the apron, as shown in figure 1. Each outsert is fitted over the corresponding lens by stretching the wider channel of the soft rubber apron to slip over the eyering.

6. Facepiece
(fig. 3)

The facepiece assembly of the M17 field protective mask is comprised of the components described below.

a. Faceblank.

(1) The faceblank (11, fig. 3) is the molded rubber base of the facepiece. The cheeks of the faceblank contain pouches which hold filter elements (16). Faceblanks are molded in two sizes, small and medium. The letter S or M is molded in the top portion of the faceblank to indicate the size. Nosecups (*f* below) are made in medium (M) and large (L) sizes. Combinations of different sizes of faceblanks and nosecups provide three facepiece sizes:

S faceblank + M nosecup = small facepiece
M faceblank + M nosecup = medium facepiece
M faceblank + L nosecup = large facepiece

(2) A medallion, which indicates the name of the manufacturer, year of production, and the like, is embossed on the front of the facepiece to the rear of the left eyepiece and just above the left pouch. Figure 4 explains the markings on the medallion.

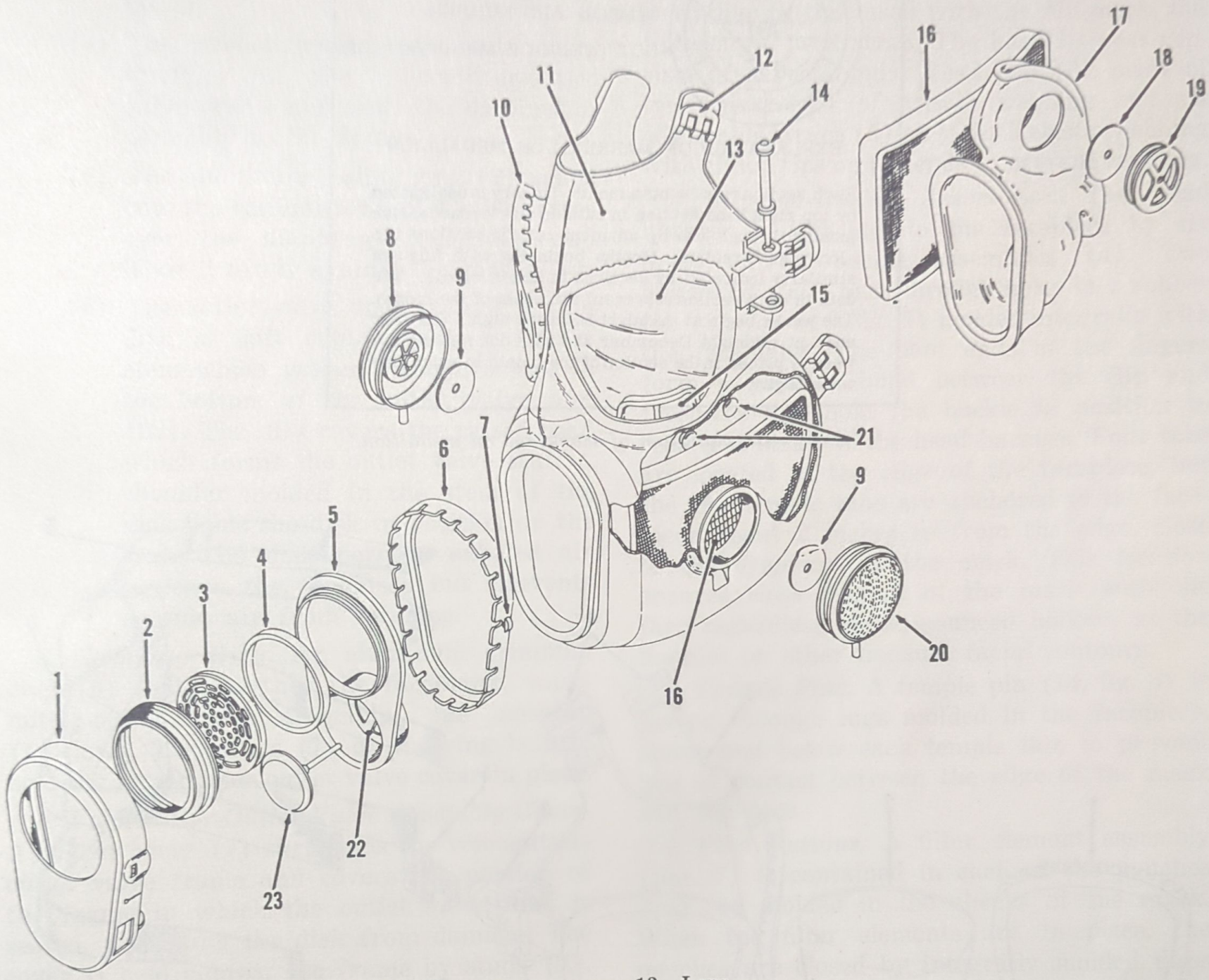
(3) Deflector tubes, which direct the purified air across the lenses, are molded into the faceblank. The outlet of a deflector tube (15) is shown in figure 3.

b. Lens and Eyering. Two optically clear plastic lenses (13, fig. 3; 2, fig. 5) are held in place over openings molded in the faceblank by aluminum alloy eyerings (10, fig. 3; 1, fig. 5). Lenses, eyerings, and outserts (par. 5) are shaped and contoured to give the wearer of the mask a wide unobstructed field of vision.

c. Voicemitter-Outlet Valve Assembly.

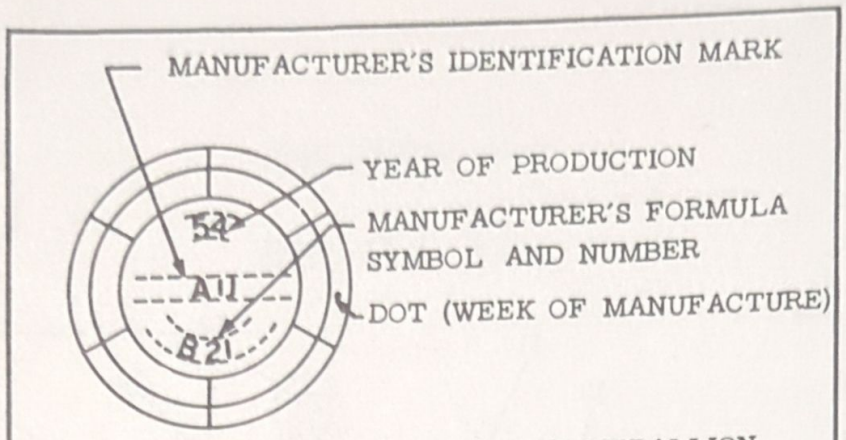
(1) The voicemitter-outlet valve assembly permits the wearer of the mask to communicate understandably and to exhaust exhaled air. The assembly consists of a frame, a diaphragm assembly, a rubber gasket, an aluminum sealing ring, and an outlet valve seat and disk.

(2) The voicemitter-outlet valve frame (5, fig. 3) is an aluminum alloy stamping. An opening in the upper portion of the frame accommodates the diaphragm assembly. A well in the lower portion forms the outlet valve seat and houses the valve disk.



1 Voicemitter-outlet valve cover
2 Sealing ring
3 Diaphragm assembly
4 Rubber gasket
5 Voicemitter-outlet valve frame
6 Crimping ring
7 Stud
8 Inlet valve assembly (inside view)
9 Valve disk
10 Eyering
11 Faceblank
12 Tab for clip-and-buckle assembly
13 Lens
14 Temple pin (untrimmed)
15 Deflector tube
16 Filter element
17 Nosecup
18 Valve disk
19 Nosecup valve
20 Inlet valve assembly (outside view)
21 Flap buttons
22 Outlet valve seat
23 Outlet valve disk

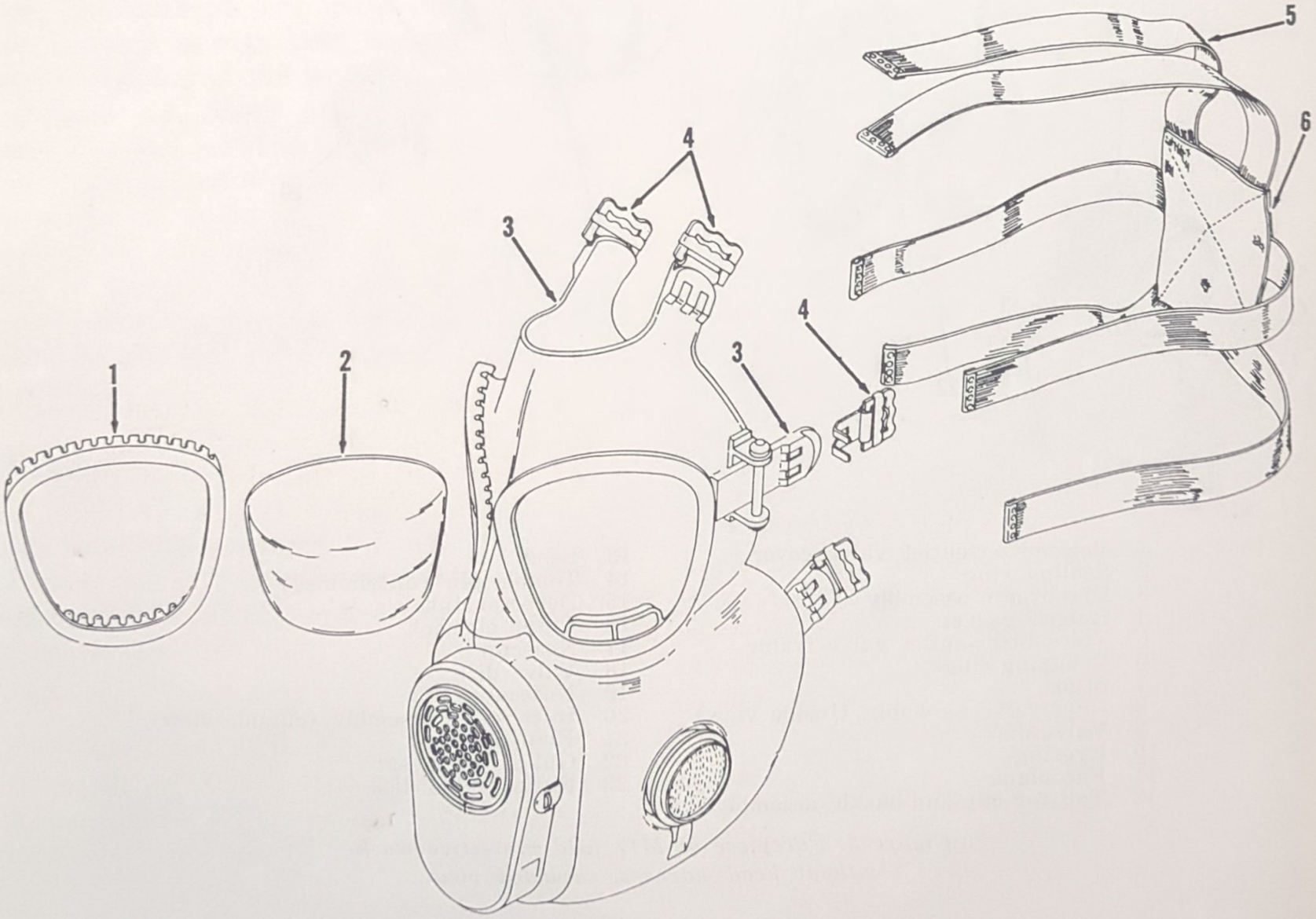
Figure 3. Facepiece of M17 field protective mask without head harness, exploded view.



EXPLANATION OF MARKINGS ON MEDALLION

Each section represents a month. January is designated by top right hand section in outside circle; successive months through June by adjacent outside sections in a clockwise direction. Months beginning with July are similarly indicated by sections in inside circle. The dots in each section represent the weeks of the month. The weeks begin at midnight Saturday night. The year ends at midnight December 31. The dot for any one week is placed in the section of the month in which that week began.

Figure 4. Explanation of markings on medallion.



1 Eyering
2 Lens
3 Tab
4 Clip and buckle assembly
5 Strap
6 Head pad

Figure 5. Lens and head harness without lens outsert, exploded view.

(3) The diaphragm assembly (3) consists of an outer baffle, an inner baffle, Mylar (plastic) film, and a perforated cup. These components are fastened together as a unit in an aluminum retainer.

(4) The rubber gasket (4) rests on a shoulder in the voicemitter-outlet valve frame and seals the diaphragm assembly to the frame.

(5) The aluminum sealing ring (2) snaps onto the voicemitter-outlet valve frame over the diaphragm assembly and holds it firmly against the gasket (4).

(6) The outlet valve disk (23) is a thin disk of soft rubber with a rubber stem which passes through a hole in the bottom of the outlet valve seat (22). The disk covers the raised bead which forms the outlet valve seat. A shoulder molded in the stem of the disk holds the disk in position on the seat. The disk permits exhaled air to leave the facepiece but prevents outside air from intering.

d. Crimping Ring. An aluminum crimping ring (6) seals together the faceblank, voicemitter-outlet valve assembly, and nosecup (*f* below). Two studs (7) on the ring help to hold the voicemitter-outlet valve cover in place.

e. Voicemitter-Outlet Valve Assembly Cover. A rubber cover (1) surrounds the voicemitter-outlet valve frame and covers the portion of the frame in which the outlet valve disk is seated, protecting the disk from damage. The cover is held against the frame by studs (7). Exhaled air passes through four holes molded in the lower edge of the cover. At temperatures below freezing, moisture in exhaled air may freeze the outlet valve to the seat. The lower portion of the cover can be lifted by a tab to permit massaging the disk to loosen it.

f. Nosecup. The nosecup (17) prevents fogging of the lenses of the mask by preventing exhaled air from impinging on the lenses. The nosecup, made of soft molded rubber, fits over the nose and mouth of the wearer. The front portion of the nosecup is crimped in place by the crimping ring (6). The nosecup is fastened to the inside of the facepiece by plastic buttons (*j* below). Two nosecup valve assemblies, consisting of soft rubber valve disks (18) and metal valve seats (19), permit filtered air to enter the nosecup but prevent exhaled air from coming in contact with the lenses.

g. Head Harness. The head harness (fig. 5) is similar to that used with the M9 mask, but there is no neck strap. The head harness consists of a rectangular head pad (6) made of two thicknesses of canvas webbing and six adjustable straps (5) of 7/8-inch elastic webbing with clinch tips on the ends to prevent raveling.

h. Clip-and-Buckle Assemblies. The head harness is attached to the facepiece by six brass clip-and-buckle assemblies (4). Two fingers of a clip pass through holes in a rubber tab (12, fig. 3; 3, fig. 5) molded integrally with the faceblank. The bent ends of the fingers form a positive bond between the clip and facepiece and hold the buckle in position to receive a strap of the head harness. Four tabs are located at the edge of the facepiece, but the two temple tabs are anchored to the facepiece about 2 inches in from the edge, close to the eyepieces of the mask. This location ensures close contact of the mask with the face regardless of pronounced hollows at the temples or other unusual facial contours.

i. Temple Pins. A temple pin (14, fig. 3) is passed through lugs molded in the facepiece, above and below each temple tab, to prevent loss of contact between the edge of the mask and the face.

j. Flap Buttons. A filter element assembly (par. 7) is contained in each of the pouches (par. 4) molded in the cheeks of the mask. When the filter elements are in place, the pouches are closed by integrally molded flaps so that filtered air will not escape into the main cavity of the mask except through the deflector tubes (*a*(3) above). Each flap is fastened by two flap buttons (21, fig. 3), one short and one long. The short button is used to fasten the end of the flap nearest the edge of the mask. The long button is used to fasten the end of the flap nearest the nosecup and also to engage a small hole in the lower portion of the nosecup (*f* above), holding the nosecup firmly against the inside of the facepiece.

7. Filter Element Assembly

a. A filter element assembly (fig. 6), molded to conform to the contours of the mask, is con-

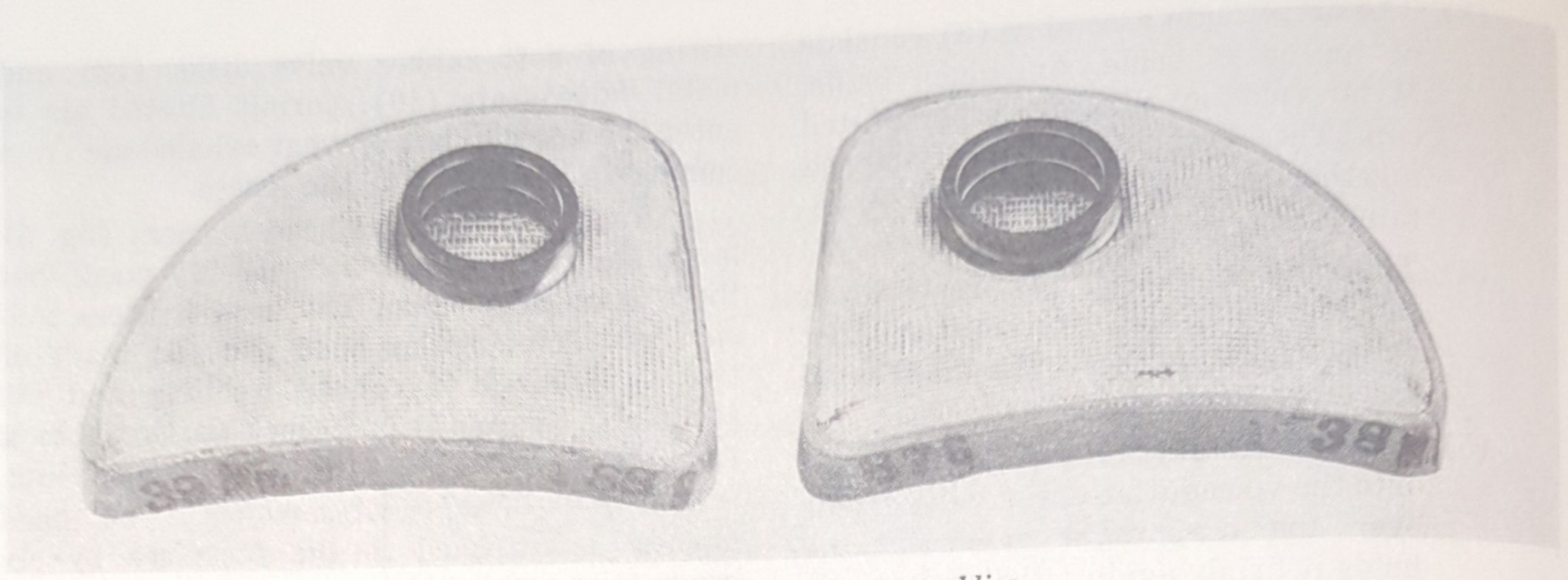


Figure 6. Filter element assemblies.

tained in each cheek pouch. The filter elements are made specifically for either the right side of the mask or for the left.

b. Each filter element assembly consists of a filter element and a connector.

(1) A filter element consists of two layers of mineral fiber and charcoal. Each layer is faced front and back with a thin layer of fabric. The two layers of filtering material are separated by a layer of corrugated screening and a plastic stiffener. The corrugations permit incoming air to disperse inside the filtering element and to pass through all filtering areas of the element for purification. The outer surfaces of the filter element are overlaid with plastic mesh screening. The two layers of filtering material are bonded together with vinyl plastisol along their edges to form a unit.

(2) An aluminum connector passes through the outermost layer of filtering material. A flange at the external end of the connector projects through the side of the facepiece and makes close contact with the rim of a hole in the facepiece. The portion of the connector which extends through the side of the mask also serves as housing for the air inlet valve in the inlet valve assembly (par. 8).

8. Inlet Valve Assembly

a. The inlet valve assembly (8 and 20, fig. 3) is a circular aluminum fitting which incorporates a rain-repelling outer surface and an inner valve seat and disk. It serves the following purposes:

(1) Permits air to enter the filter element.

(2) Prevents filtered air from flowing out through the filter element.

(3) Prevents frost from clogging the inlet valve disk.

(4) Prevents physical damage to the filter element.

(5) Protects the filter element from rain.

b. The inlet valve assembly fits over the connector of the filter element assembly. Its convex outer portion (20, fig. 3) is made of rain-repellent flocked wire mesh. The middle portion of the assembly (8) is raised to form the inlet valve seat. At the center of the middle portion is a stud which holds a soft rubber valve disk (9) in place. The disk permits air to inter the filter element but prevents filtered air from flowing out of the mask through the filter element. A tab on the outer rim of the inlet valve assembly facilitates lifting it from the connector.

9. M15 Field Protective Mask Carrier (fig. 7)

a. General. The M15 carrier is made of olive drab cotton duck and is lined with olive drab cotton cloth. Strips of fiberboard are placed at critical locations between carrier fabric and liner to act as stiffeners. The carrier is provided with a shoulder strap, a waist strap, and pockets. The carrier is closed with a flap which is fastened with snap fasteners. The

Figure 7. M15 field protective mask carrier.

fastened flap of the carrier is positioned vertically against the wearer's body.

b. Dimensions. The M15 carrier is irregular in shape. Its greatest dimension is approximately 10 inches. From the top of the closed flap to the opposite side, the carrier dimensions vary from 7 to 8½ inches exclusive of the pockets, which are sewed to the rear (opposite the flap side) and bottom of the carrier.

c. Pockets. The pocket at the rear nearest the top contains a loop of webbing sewed to its inside wall to hold an M1 antidim set. This pocket also contains the shoulder strap when the mask is carried at the belt (*e*(3) below). Beneath this pocket is another pocket designed for an M5A2 chemical warfare agents protection and treatment set; these pockets are closed with snap fasteners. A third pocket is sewed to the bottom of the carrier. This pocket is designed to contain the M1 protective mask waterproofing bag (par. 14) and also the waist strap when the strap is not being used by the wearer. One end of the waist strap is sewed to the carrier close to the location of this pocket. The waist strap is rolled around the snap hook attached to the free end, the rolled strap is put into the pocket, and the pocket snapped shut. There is one pocket inside the carrier, located opposite the open end of the carrier. This pocket contains the eyelens outserts when they are not in use.

d. Marking.

(1) Neither mask nor carrier will be marked (AR 746–10) to designate the individual to whom the mask is assigned. However, it is important that a mask be used only by the individual to whom it is issued and fitted. For this reason, it is suggested that a code mark be assigned to each individual in a unit for use by him during his association with the unit. On transfer

of the individual, the mark is retained by the unit and is reassigned to a new member of the unit when the mask is reissued. These code numbers should be used to mark compartments in the shipping box (par. 47) in which personnel will keep their masks in unit storage.

(2) Each unit will devise its own code, taking care not to include any designations which may in any way identify the parent organization. Also, a code should not be similar to the code of a neighboring unit.

e. Carrying Strap Assemblies.

(1) *Shoulder strap assembly.* The shoulder strap assembly consists basically of a canvas webbing strap 1½ inches wide, one end of which is sewed to the upper rear portion of the carrier. A metal buckle, sewed to the free end of the strap, permits adjustment. A metal snaphook in the adjustable loop hooks to the D-ring at the top of the carrier.

(2) *Waist strap assembly.* The waist strap assembly consists basically of a canvas webbing strap ¾-inch wide, one end of which is sewed to the lower rear portion of the carrier. A metal buckle sewed to the free end of the strap permits adjustment. A metal snaphook is held in the adjustable loop formed at the end of the strap by the buckle. The snap hooks to a D-ring sewed to the back of the carrier.

(3) *Belt-carry strap.* A 5-inch strip of 2-inch canvas webbing is sewed horizontally across the back of the carrier, as shown in figure 7. The material forms keepers for fingers of double-hook attachments in a pistol belt, by which the mask can be suspended from the belt.

10. M1 Antidim Set
(fig. 8)

a. General. The M1 antidim set is used to reduce fogging of the lenses of the mask. Antidim causes condensed vapor to form an even film on the lenses, thus preventing the distortion of vision which would occur if the vapor condensed in drops on the lenses. The set is carried in a pocket of the carrier (par. 9*c*).

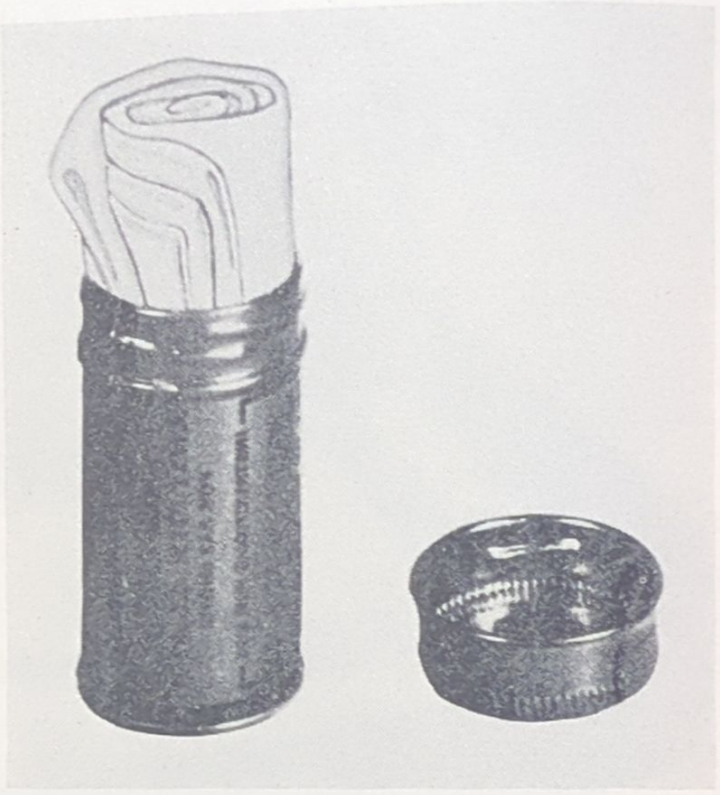


Figure 8. M1 antidim set.

b. Description. The M1 antidim set consists of a small cylindrical can containing a piece of cotton flannel, 6 inches by 10 inches, impregnated with a compound which reduces the surface tension of water.

c. Use.

(1) Use the antidim cloth on the lenses every time the mask is cleaned and before and after each wearing of the mask. Antidim can also be used on spectacles worn inside the mask.

(2) Wet the fingertips and moisten inner surfaces of the lenses.

(3) Rub vigorously with the antidim cloth until the surface is clean and dry. Be sure that the cloth is free of grit.

(4) If the antidim cloth becomes wet, allow it to dry without wringing.

SECTION IV

ACCESSORIES

11. General

Accessories described in this section are authorized for use with the M17 field protective mask. This section contains information on the M5A2 chemical warfare agents protection and treatment set, gas mask spectacles, the M1 protective mask waterproofing bag, and a protective hood.

12. M5A2 Chemical Warfare Agents Protection and Treatment Set (fig. 9)

a. General. The M5A2 chemical warfare agents protection and treatment set is issued to the individual for first aid in combat, to protect him from certain chemical warfare agents. The M5A2 set consists of a hinged-top metal can containing an automatic atropine injector, three tubes of M5 vesicant agent protective ointment, a tube of BAL eye ointment, and three pieces of absorbent blotting cloth (one illustrated). The set is carried in a pocket of the carrier (par. 9*c*). Brief instructions for use are printed on the container. Detailed instructions for use of the set are given in FM 21–40, FM 21–41, and TM 8–285.

b. Atropine Injector. The automatic atropine injector is used by the individual to give himself first aid against G-agents. The injector is a tube approximately ⅜ inch in diameter by 3¾ inches long with a red safety at one end and a blue tip at the other. An injection of atropine is contained in the tube. A spring in the injector powers a hollow needle through which atropine is forced. To use the atropine injector, remove the red safety and press the blue end hard against the thigh. Directions for use of the injector are printed on the tube.

c. M5 Vesicant Agent Protective Ointment. Primary use of the M5 ointment is for protection against possible blister gas contamination of the skin; however, the ointment may also be used to decontaminate the skin where liquid vesicant (blister) agent has come in contact with it. M5 ointment may also be used to decontaminate individual equipment, such as the mask. Each tube of M5 vesicant agent protective ointment contains approximately two-thirds of an ounce. The olive drab collapsible tube has a breakoff tip; the tube is wrapped in a piece of absorbent blotting cloth.

d. BAL Eye Ointment. BAL eye ointment counteracts the effects of liquid arsenical vesicant agents should such agents come in contact with the eye. The yellow tube of BAL eye ointment has a breakoff tip and contains about one-tenth of an ounce.

13. Gas Mask Spectacles

Gas mask spectacles are available, by prescription of the medical officer in charge, for personnel who must wear glasses with the mask. The spectacles are designed to fit as inserts which snap into the eyepieces of the mask. For procedure and authorization, refer to AR 40–117.

14. M1 Protective Mask Waterproofing Bag (fig. 10)

a. General. The M1 waterproofing bag is used to keep the M17 mask dry during amphibious operations. A bag is issued with each mask in the combat zone, and in the Zone of Interior as required. When not in use, the bag is carried in the carrier pocket described in paragraph 9*c*.

b. Description. The M1 waterproofing bag, 19 inches long and 13 inches wide, is made of flexible plastic material; instructions for use are printed on the bag. A small plastic envelope containing three rubber bands is contained in the bag. The bag folds to 4½ inches by 2½ inches for packaging in a plastic pouch. The pouch is closed by a flap which is sealed to a metal strip, the ends of which protrude on either side of the pouch so that they can be

Figure 9. M5A2 chemical warfare agents protection and treatment set.

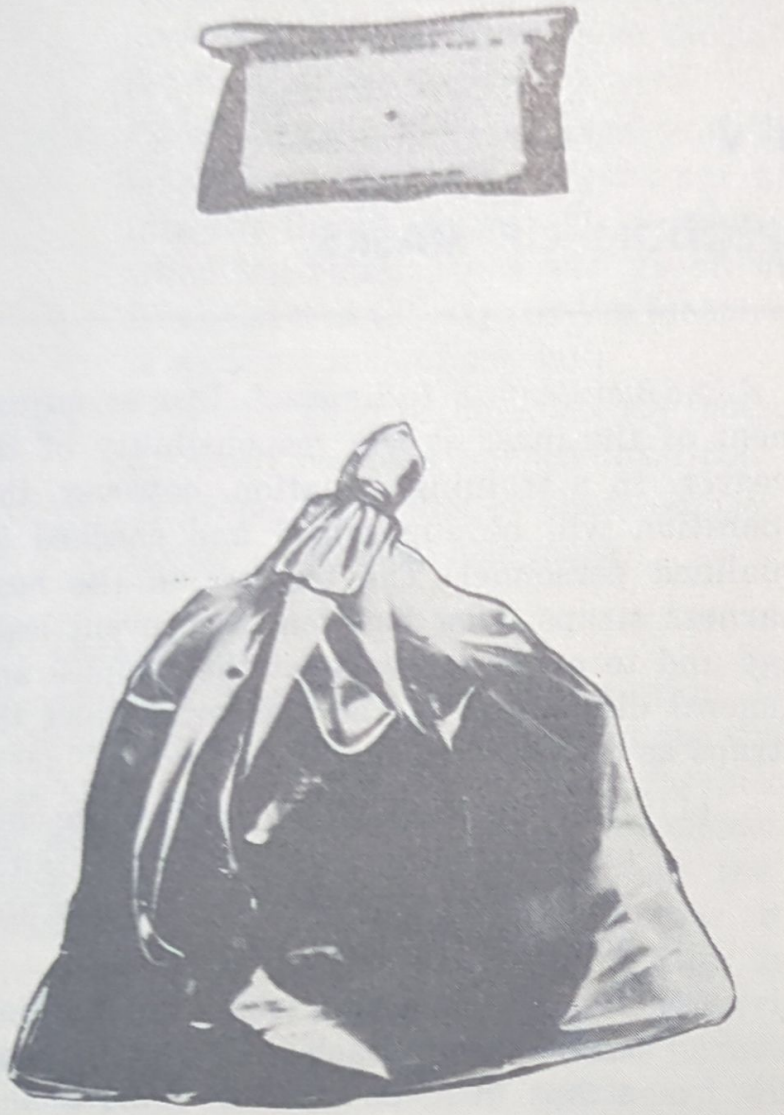


Figure 10. M1 protective mask waterproofing bag.

bent inward to secure the flap when it is rolled down.

c. Use. Remove the waterproofing bag from the carrying pouch and take one rubber band from the envelope inside the bag. Place the mask in the waterproofing bag with the nose toward the open end of the bag. Gather the open end of the bag close to the mask and press the bag against the body to remove air; twist the open end of bag tightly and fold over. Loop a rubber band around the twisted portion of the bag as many times as possible. Place the mask in the carrier with the twisted portion of the bag toward the opening of the carrier and the bottom of the mask on the bottom of the carrier. To open the waterproofing bag, grasp the end that has been folded over and pull hard. After taking the mask from the bag, fold and return the bag to its pouch and return the pouch to the carrier. Do not store the mask in the waterproofing bag for more than 24 consecutive hours.

Warning: **Do not permit the bag to come into contact with foodstuffs; possible toxic effects may result.**

15. Protective Hood

A protective hood is being developed for use with the M17 mask. It will be available for use at a later date.

SECTION V

FITTING, CARE, AND INSPECTION OF MASKS

16. Fitting

a. General. Proper fitting of field protective masks is a command responsibility which may be delegated to a qualified representative who will supervise the fitting. Proper fitting prevents leakage between the facepiece and the wearer's face, and allows the mask to be worn comfortably.

b. Basic Principles of Fitting. The mask must fit the contour of the face. The centers of the pupils of the eyes should be near the centers of the lenses. Of the three sizes of mask (par. 6*a*), select the size which gives the most comfortable gastight fit. Facepieces are flexible; in most cases, a good fit can be obtained by slight adjustment of the head harness straps. Do not attempt to correct grossly misfitting masks by adjustment of head harness straps because major adjustments may create strains on the facepiece causing it to leak or, at best, to be uncomfortable. In such case, select a mask of another size. A mask which is too small has a tendency to sit forward on the wearer's face, usually causing the temple straps to cut the ears; also, if a mask is too small, lenses will be relatively too low with respect to the eyes. If a mask is too large, the edges of the facepiece will cut into the ears and throat of the wearer and the lenses will be too high for the eyes.

c. Preliminary Procedure. The individual will place his mask on his face with his chin resting snugly in the chin pocket. Place the head pad well down on the back of the head. Determine the position of pupils of the eyes with respect to the lenses. If the pupils are less than one-half inch from the tops of the lenses, the mask is too small. If the pupils are less than 1 inch from the bottom of the lenses, the mask is too large. If the correct position cannot be attained after adjustment (*d* below), exchange the mask for one that can be fitted correctly.

d. Adjustment to Individual. Proper adjustment of the mask is the responsibility of the wearer. In a training situation, however, this operation will be supervised and checked by qualified personnel. The tension on the head harness straps must be even, to prevent leakage and to avoid pressure at the temples and general discomfort to the wearer. Adjust the straps as directed below.

(1) Hold the mask firmly against the chin and center the head harness pad fairly well down on the back of the head, and hold it there with one hand.

(2) Remove the hand from chin position and tighten each of the forehead straps just enough to remove any slack. (The straps are best adjusted by a rapid pull or jerk, rather than by a steady pull.)

(3) Tighten each cheek strap until straps are moderately and evenly tightened.

(4) Remove the hand from the pad of the head harness and adjust the temple straps to moderate tightness. These straps should clear the tops of the ears. (See FM 21–40 for additional information on adjusting fit of the mask.

***Caution:* If the straps are too tight, headaches and discomfort may result or a channel may develop at the edge of the facepiece, allowing gas to enter.**

e. Checking Fit. Check fit of the mask as follows:

(1) Examine eye positions to see that the pupils of the eyes are near the centers of the lenses.

(2) Check the mask to see that it does not fit so tightly that pressure is exerted on the flesh around the eyes, causing the eyes to be partly closed.

(3) Check to see that the mask does not press painfully on the nose or cut into the flesh at the wearer's throat.

(4) Check to be sure that the edge of the mask does not touch the ears nor cut into the throat. Proper fit is attained when the mask comes well up on the forehead and the edge of the facepiece is within 1 inch of the ears.

(5) If slight gaps or channels are noted, carefully readjust the head harness.

(6) If proper fit cannot be obtained, try a larger or smaller size mask.

17. Leakage

a. General. For the wearer's protection, his facepiece must be checked for leaks at the time it is fitted to him. Before testing the facepiece for leakage, make sure that both filter element assemblies are properly positioned in their pouches, that inlet valve assemblies (par. 8) are in place on the connectors of the filter assemblies, and that the mask has been properly fitted by correct adjustment of the head harness assembly. A heavy growth of stiff beard will usually make it difficult to obtain a leakproof fit.

(1) *Tests.* Press the palms of the hands firmly over the inlet valve assemblies. Do not press so hard that the facepiece will be distorted to the extent that leakage will occur around the edges of the mask. With the inlet valves thus closed, inhale *normally* and hold the breath for 10 seconds. (If one inhales too strongly, he may close a hole that would admit contaminated air when breathing is normal.) If the facepiece tends to collapse during this test period, an effective airtight seal is indicated. If the facepiece does not collapse, a faulty facepiece or incorrect adjustment of the mask to the face is indicated.

(2) *Correction.* If the above test indicates leakage, the leak *must* be located and the cause eliminated. If it is not possible to locate the leak or to correct it, the mask must be replaced.

b. Leakage Around Edges. Leakage around the edges of a facepiece is caused by improper adjustment of the head harness or by a mask of improper size. Visual inspection will usually disclose a bulge at the edge of the mask at the point of leakage. The wearer may be able to indicate the point of leakage by the feel of incoming air. Leakage can be detected in some cases by observing breaks in the red mark left on the face by the edges of the facepiece after prolonged wearing of the mask.

(1) To overcome leakage at the cheek, lift the head harness pad higher on the head and tighten the forehead straps.

(2) To overcome leakage at the temple, tighten both forehead and temple straps.

(3) When leakage occurs at the forehead, tighten the temple straps.

(4) When leakage occurs at the throat or under the chin, readjust the mask on the face by grasping the eyerings and lifting the mask slightly higher on the face, so that the chin is seated firmly in the chin pocket. Tightening the cheek straps may also help correct leakage at the throat or under the chin.

(5) If leakage still continues around the edges of the mask, fit a mask of another size.

c. Outlet Valve Leakage. Leakage of air into the mask may be caused by an outlet valve which is faulty or which is held open by foreign matter. Any debris present usually can be cleared by several rapid and powerful exhalations. Sticking disks can usually be released by manipulation of the disk with the finger after lifting the rubber voicemitter-outlet valve cover. Masks with defective valves must be replaced.

d. Defects in Faceblank. When other possible sources of leakage have been investigated and eliminated, all portions of the faceblank should be examined closely for breaks, tears, or holes. Such defects are likely to occur around the eyepieces. If defects are found in the faceblank, replace the mask.

18. Care of Mask

a. General. With reasonable care and attention, the M17 mask will have long life because it is designed to withstand the wear and tear of field service. There is, however, always danger of mechanical damage to rubber, metal,

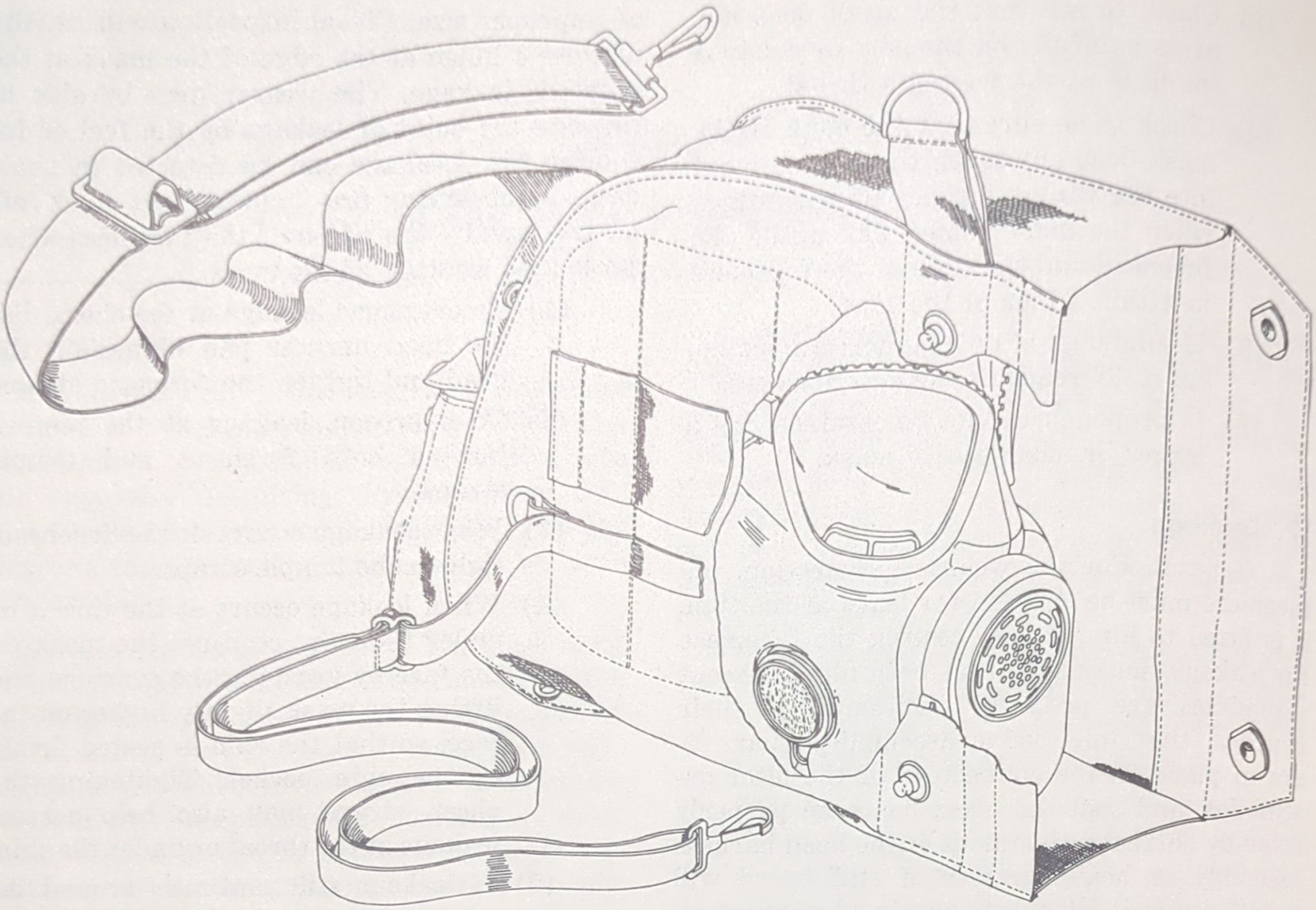


Figure 11. M17 field protective mask in M15 carrier, cutaway view.

or plastic parts resulting from rough handling. Rubber portions of the mask are subject to deterioration when subjected to extreme heat; water will damage the mask if it wets the filter elements; and dampness will cause mildew to attack the fabric of the carrier and the head harness. Whenever the mask is not being worn, keep it in the carrier in the position shown in figure 11. Fold the head harness into the mask cavity. Place the mask in the carrier with the lower portion of the mask resting on the wider edge of the carrier, the nose toward the carrier flap.

b. Care of Rubber Parts. Aging of rubber starts slowly but proceeds at an increasing rate; it is greatly accelerated by exposure to light and heat and contact with organic solvents. These conditions must be avoided wherever masks are kept. The first indication of progressive deterioration is noted when the rubber begins to set. It then becomes tacky and, finally, dry and brittle. When rubber parts begin to set, the mask must be replaced.

c. Care in Cold Climate. In extremely cold climate, keep the mask under outer clothing prior to its anticipated use. This precaution is necessary to prevent cold shock (localized frostbite).

d. Care in Hot Climate. In hot climates, little can be done to protect the mask against the aging of rubber except to keep the mask out of direct sunlight whenever possible. When the mask is not being worn, always keep it in as cool and dark a storage place as is available.

e. Cleaning and Conditioning. Masks must be cleaned and conditioned at least twice a year and before they are turned in or exchanged. Cleaning and conditioning procedures are described under organizational maintenance (pars. 30 and 35).

19. Care of Carrier

a. Except in the pockets especially designed for carrying specific equipment (par. 9*c*), the carrier must never be used as a receptacle for anything other than the protective mask and accessories for which it is designed.

b. The carrier should be cleaned and reconditioned at least twice a year. Clean the carrier in the same way as individual web equipment (FM 21–15). Do not recolor the carrier.

20. Field Inspection of Masks

a. General. Field inspections are means by which commanders at all echelons, acting within the scopes of their command missions, determine the serviceability of equipment and the efficiency of maintenance procedures. There are three types of inspection for masks: command maintenance inspection, bulk inspection, and individual inspection.

b. Defective Masks. When masks are found to be defective, the defects must be reported to proper authority. Facepieces which are defective should be identified as to name of manufacturer, date of manufacture, and manufacturer's formula, symbol, and number. These data are obtainable from the medallion embossed on the faceblank, as explained in figure 4.

21. Command Maintenance Inspection of Masks

Command maintenance inspection is made in accordance with AR 750–8 to determine the serviceability of masks and to determine future maintenance and exchange requirements. This inspection is usually made by field maintenance personnel who have equipment to determine the serviceability of the filter elements. In the interest of economy and efficiency, commanders should avail themselves of the opportunity to conduct inspections after equipment has been serviced or repaired at maintenance shops and before it is returned to the field. See applicable surveillance procedure for standards of visual examination to be used in the inspection.

22. Bulk Inspection

Bulk inspection is made in connection with repairing or salvaging of masks by chemical depot personnel, by chemical maintenance units, by battalion or regimental officers, or by noncommissioned officers as authorized. If decontamination has been necessary, inspectors check each component of the equipment after decontamination and make sure that the equipment is repaired or discarded as authorized (FM 3–60).

23. Individual Inspection

Each individual is responsible for the condition of his own mask. He must make a minute visual inspection (FM 21–40). This inspection must include examination of facepiece assembly, filter elements, carrier, and accessories. Defects in masks must be reported to the senior noncommissioned officer.

24. Inspection Checklist

A list of points to be covered in visual inspection of the M17 field protective mask is given below.

a. Complete Mask Assembly.

(1) Improper position in carrier.

(2) Filter elements not buttoned in pouches.

(3) Chin portion of nosecup beneath chin stop of faceblank. (Chin portion of nosecup must be over chin stop of faceblank (par. 34*e*(5))).

b. Facepiece.

(1) *Faceblank.*

(*a*) Permanent set affecting fit.

(*b*) Tackiness, hardness, or brittleness.

(*c*) Dry rot (fine cracks).

(*d*) Discoloration, dirt, or mold.

(*e*) Holes, tears, or splits (especially around eyepieces).

(*f*) Blocking or constriction of deflector tubes.

(*g*) Loss of temple pins.

(2) *Tab assemblies.*

(*a*) Cuts or tears likely to cause severance of tab from faceblank.

(*b*) Clip and buckle assemblies—corroded; not fastened to tabs.

(3) *Eyepieces.*

(*a*) Eyerings—corroded; damaged; insecurely fastened to faceblank.

(*b*) Lenses — cracked, chipped, scratched, broken; distorted or discolored.

(4) *Outserts.*
- (*a*) Lenses loose in rubber aprons.
- (*b*) Lenses — cracked, chipped, scratched, broken; distorted or discolored.
- (*c*) Rubber aprons tacky, stiff, cracked, or torn.

(5) *Nosecup.*
- (*a*) Crimping ring improperly fastened to faceblank.
- (*b*) Not fastened by long flap button.
- (*c*) Missing or damaged valve disks.
- (*d*) Loose valve seats.

(6) *Head harness.*
- (*a*) Broken or missing straps.
- (*b*) Loss of elasticity in straps, which would prevent proper fit and adjustment of mask.
- (*c*) Material frayed or mildewed.

(7) *Cheek pouches.*
- (*a*) Dirty; contains foreign matter.
- (*b*) Not fastened by two flap buttons.

(8) *Voicemitter-outlet valve assembly.*
- (*a*) Corroded.
- (*b*) Out of shape.
- (*c*) Parts loose.
- (*d*) Dirty.

(9) *Outlet valve.*
- (*a*) Foreign matter present.
- (*b*) Improper seating of valve disk.

(10) *Voicemitter-outlet valve cover.*
- (*a*) Cracked, torn, or broken.
- (*b*) Stiff, out of shape.

c. Filter Element Assemblies.
- (1) Incorrectly positioned in pouches; connectors improperly fitted in facepiece.
- (2) Connector flange out of shape.
- (3) Connector loosely connected to filter element.
- (4) Mesh screening torn.
- (5) Edge seal broken or cut.
- (6) Filter element wet.

d. Inlet Valve Assemblies.
- (1) Cap broken or damaged.
- (2) Flocked surface of cap dirty or clogged.
- (3) Damaged inlet valve seat.
- (4) Valve disks not in place on studs.
- (5) Damaged inlet valve disks.

e. Carrier.
- (1) Body mildewed, stained, torn, or ripped.
- (2) Torn or missing shoulder or waist straps.
- (3) Carrier contains unauthorized material.
- (4) Hardware missing or damaged.
- (5) Torn or missing belt-carry strap.

SECTION VI

DECONTAMINATION OF MASKS

25. General

a. It is generally not practicable to decontaminate completely masks in combat. Under no circumstances, however, should a contaminated mask be discarded unless a replacement mask is available; a contaminated mask is better than none. Drops or splashes of toxic chemical agent on the facepiece will penetrate the rubber in a comparatively short time, the time depending on the thickness of the rubber at the point of contamination. A mask so contaminated will afford some degree of protection for several hours but should be replaced as soon as possible. Contaminated masks can be made safe for wear by emergency decontamination as described in paragraph 26.

b. Decontamination of masks is a responsibility of the user or the using organization except when bulk maintenance services are required, as after a pickup of equipment from the field following a military engagement. Under such circumstances, masks are decontaminated by a chemical maintenance company or team as part of the maintenance services performed to restore the masks to useful condition. Follow procedures described in detail in TM 3–220 and FM 21–41 when handling and decontaminating contaminated equipment.

26. Emergency Decontamination of Protective Mask

a. When a mask contaminated with drops or splashes of liquid toxic chemical agents is needed for immediate use, it can be given emergency field treatment with M5 vesicant agent protective ointment (FM 21–41). The treatment is effective if performed within 5 minutes after the mask has been contaminated and is of definite value on masks which have been contaminated for longer periods.

b. If the mask is contaminated with liquid toxic chemical agents while it is being worn, the wearer should blot the drops or splashes from the contaminated mask using rags, paper, leaves, or other available material and then flush with water. After this has been done, protective ointment should be applied to contaminated areas, removed, and reapplied. The ointment should not be removed from the mask until the wearer reaches an uncontaminated area where he can unmask safely. Materials used for blotting the gas drops should be buried or burned.

c. Refer to FM 21–41 and TM 3–220 for correct procedures to be followed in case of extensive personnel contamination.

27. Decontamination by Chemical Maintenance Company or Higher Echelon Personnel

a. Decontamination is performed by a chemical maintenance company only in conjunction with other necessary maintenance services (par. 25*b*). No attempt will be made to decontaminate filter elements; contaminated filter elements will be discarded and replaced with new elements.

b. Carriers are decontaminated by Quartermaster field laundries, following the procedures given in TM 3–220.

28. Decontamination of Infectious Masks

There is no standard disinfectant or decontaminant for masks. Masks which have been exposed to mycobacterium tuberculosis, spore-forming organisms, or other pathogenic organisms can be rendered safe for use by proper decontamination as specified below:

a. Remove and destroy filter elements.

b. Submerge masks in boiling water for a minimum of 30 minutes.

c. Dry masks and replace filter elements.

SECTION VII

MAINTENANCE

29. General

Categories of maintenance for the M17 field protective mask conform to standard Army practice. Repair is performed in the lowest echelon of maintenance consistent with the nature of the repair; the repair parts authorized; the tools, equipment, and time available; capabilities of personnel; and the tactical situation.

30. Organizational Maintenance

Organizational maintenance is that maintenance authorized for and performed by a using organization on equipment for which it is responsible. Organizational maintenance is broken down into two echelons.

a. First Echelon Maintenance. First echelon maintenance is performed by and is the responsibility of the individual to whom the equipment is issued. Under the supervision of the unit commander or his designated representative, the individual to whom the mask is issued must—

(1) Clean his mask at least twice a year, more frequently when the condition of the mask requires it (par. 18*e*).

(2) At scheduled intervals, inspect his mask for tears, holes, and splits; and report such defects to proper authority.

(3) Check mask for signs of deterioration of rubber parts (par. 18*b*).

(4) Notify proper authority of any damage that calls for repair or for replacement of parts.

b. Second Echelon Maintenance. Second echelon maintenance is that maintenance performed by trained personnel of the using organization. Second echelon maintenance incorporates scheduled preventive maintenance services, minor adjustments and replacements beyond those required of first echelon personnel, technical advice and assistance to first echelon, and assistance in command inspections. The using organization is permitted to replace head harness, nosecup valve disks, flap buttons, inlet valve assembly, filter elements, carrier, and authorized accessories. These items can be obtained through normal supply channels. Masks requiring repair are sent to higher echelons of maintenance.

31. Field Maintenance (Third and Fourth Echelons)

a. Third Echelon Maintenance. Third echelon personnel are authorized to perform the following maintenance services:

(1) *Temple pins.* Remove and replace temple pins.

(2) *Clip-and-buckle assemblies.* Remove and replace clip-and-buckle assemblies.

b. Fourth Echelon Maintenance. Fourth echelon personnel are authorized to perform the following maintenance services:

(1) *Faceblank.* Repair pinhole defects (cuts, tears, or holes less than $\frac{1}{16}$ inch in length) by vulcanizing. Further repair of the faceblank is not authorized.

(2) *Eyepieces.* Remove and replace eyerings and lenses.

(3) *Nosecup.* Remove and replace crimping ring and nosecup assembly.

(4) *Voicemitter.* Remove and replace voicemitter-outlet valve assembly.

(5) *Facepiece.* Test facepiece for leakage around eyepieces.

(6) *Carrier.* Make emergency repairs.

32. Depot Maintenance (Fifth Echelon)

Depot maintenance of masks is performed at Army depots. Depot maintenance normally involves repair of masks which become unserviceable in depot storage, and maintenance support of field maintenance shops when the volume of mask repair exceeds field maintenance capabilities.

SECTION VIII

REPLACEMENT AND REPAIR PROCEDURES

33. General

This section describes maintenance and repair procedures which may be carried out on M17 masks at the maintenance levels specified in the maintenance allocation chart (app. II). All repair procedures except repair of pinhole defects in faceblanks call for replacement of worn or damaged parts with new parts.

34. Filter Element Assemblies

a. Removing Inlet Valve Assembly (fig. 12). Place the end of the thumb beneath the tab on the inlet valve cap and lift the inlet valve assembly away from the mask. Place both inlet valve assemblies together at a clean spot and check to make sure that the valve disks are in place inside the caps and are in good condition.

Figure 12. Removing inlet valve assembly.

b. Reversing the Head Harness (fig. 13). Loosen buckles holding ends of the head harness straps and lengthen the straps as much as possible. Graps the head harness with both hands and place it over the front of the mask. To avoid distorting the facepiece, do not pull the head harness below the lenses.

c. Unbuttoning Nosecup and Flags. Grasp the nosecup near the button and lift it off the button (fig. 14). Unbutton the flaps of the pouches by lifting the flap off the buttons. Be sure that both buttons on each side of the mask are unbuttoned before beginning the next step.

Figure 13. Reversing the head harness.

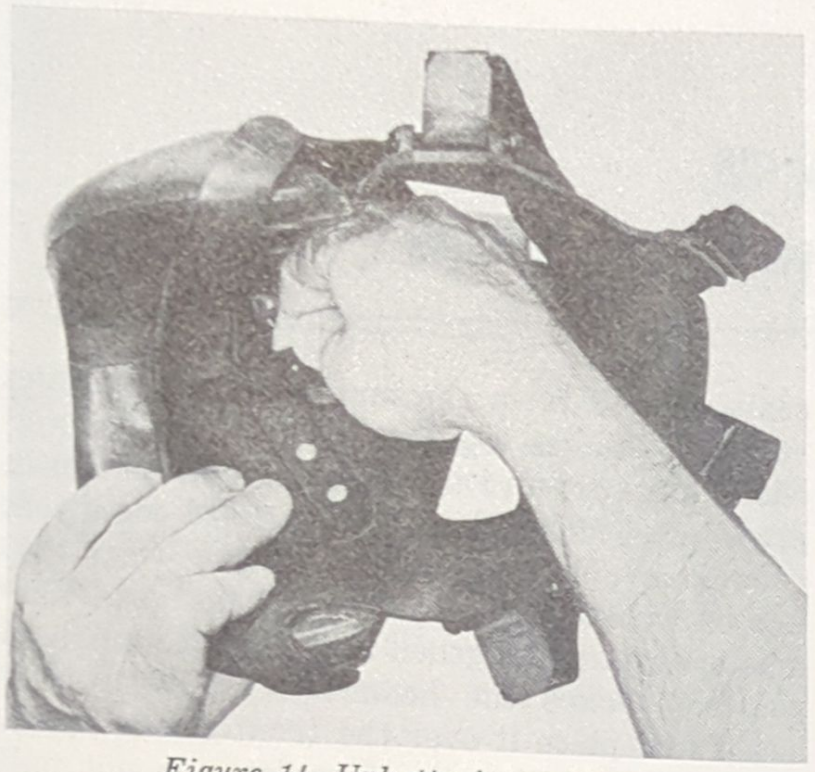


Figure 14. Unbuttoning nosecup.

d. Removing Filter Element Assemblies (fig. 15). Grasp the upper portion of one of the filter elements by placing four fingers on the connector side of the filter element and the thumb on the opposite side. With the other hand, grasp the outside of the facepiece between the voicemitter-outlet valve assembly and the connector. Pull each filter element from the mask.

e. Replacing Filter Element Assemblies.

(1) Determine the correct filter element assembly for each pouch by placing an element against the outside of the mask to line up the element with the contour of the facepiece. This preliminary step is necessary to avoid attempts to place a right filter element in a left pouch, and vice versa.

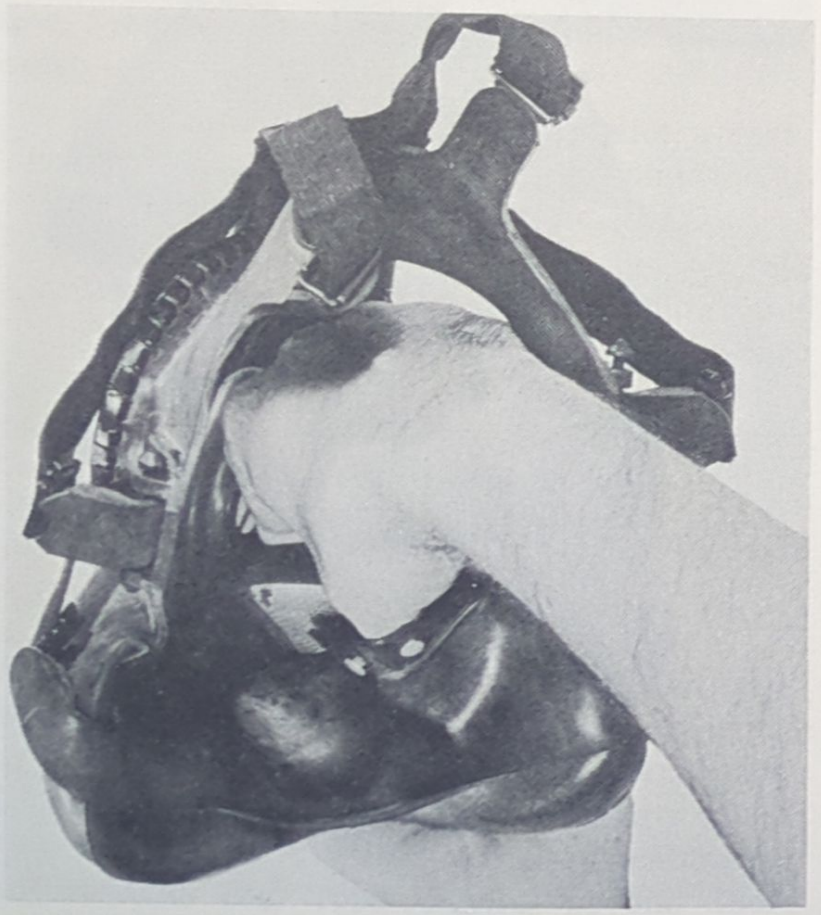


Figure 15. Removing filter element assembly.

(2) Spread the opening of the cheek pouch by pulling the lower edge of the facepiece (chin stop) outward. Grasp the element by the square corner with the fingers on the connector side and the thumb on the opposite side. Insert the curved edge of the element in the pouch opening. With a slight turning motion, push the element up into the cheek area of the pouch (fig. 16). Grasp the corner of the element which is nearest the ear by pinching it through the facepiece and work the element into approximately its correct location with the connector projecting through the facepiece. Insert the second element in the same manner. Allow the nosecup and the pouch flaps to fall back into their normal positions.

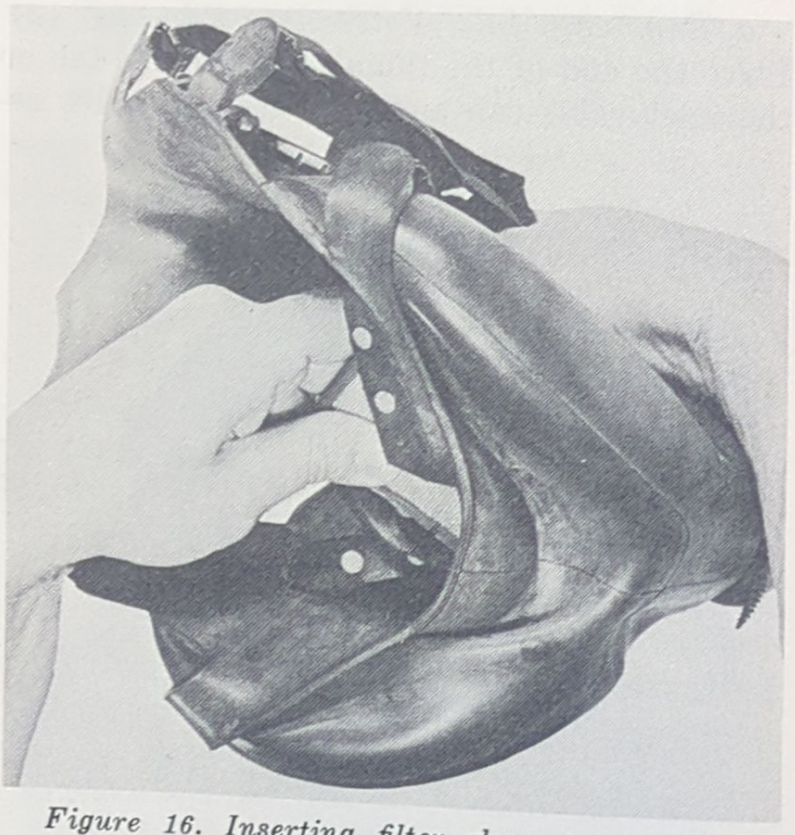


Figure 16. Inserting filter element assembly.

(3) After both filter elements are in place, button the flaps and the nosecup. Place a finger of one hand under the base of the button closest to the edge of the mask and, with the other hand,

slip the head of the button through the corresponding hole in the flap. Fasten the second button in the same flap in the same manner. Slip the hole in the nosecup over the inner button. Repeat the operation for the flap on the other side of the mask.

(4) Return the head harness to its correct position. Adjust straps to approximately their correct lengths.

(5) Work the molded rubber neck under the flange of the connector attached to a filter element (fig. 17). After the rubber neck is properly seated under the connector flange, recheck the position of the filter element in the pouch and make any necessary adjustments. Repeat the operation on the opposite side of the mask. Make sure, during this check, that the chin portion of the nosecup lies *on top* of the chin stop of the faceblank and that both flaps and the nosecup are buttoned down. When positions of these parts are reversed, moisture from exhaled air can inter the filter element pouches and damage the elements.

f. Replacing Inlet Valve Assemblies. Place the tab side of the inlet valve assembly under the flange of the connector and snap the cap into position. Check to see that the tab is positioned in the notch molded for it in the facepiece. Repeat the operation with the other inlet valve assembly on the opposite side of the mask.

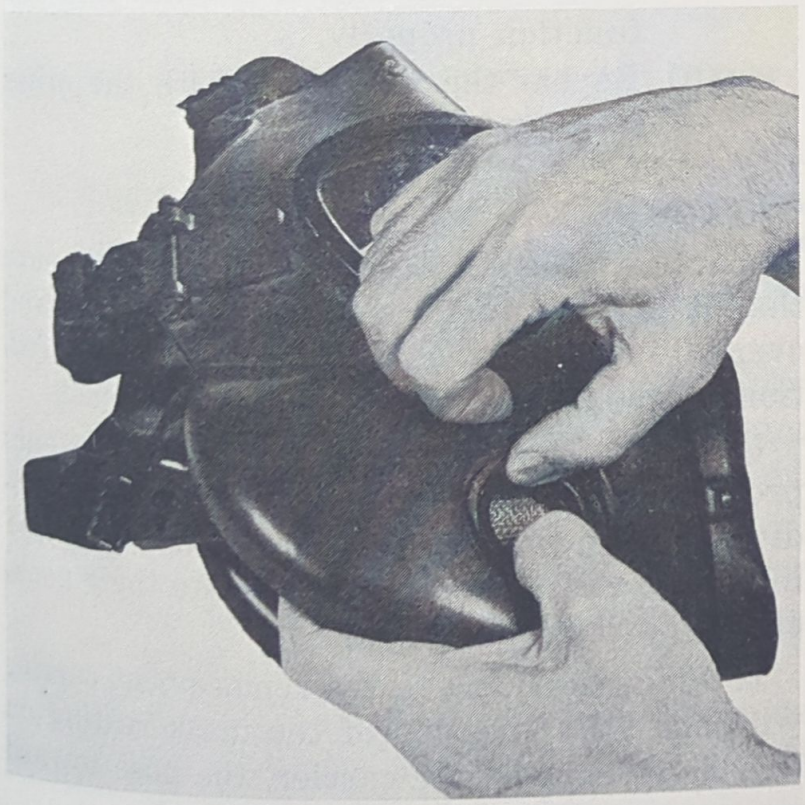


Figure 17. Adjusting rubber neck under connector flange.

g. Refitting the Mask. Refit the mask to the wearer (par. 16). If possible, check the fit in a CN or chlorine gas chamber (FM 21–48).

35. Cleaning and Conditioning Mask

a. Facepiece. Remove the mask from the carrier. Remove the filter element assemblies (par. 34*d*) and the voicemitter-outlet valve assembly cover. Wash the mask thoroughly with hot soapy water using a cloth or brush. Rinse the facepiece thoroughly with clear water and allow the excess water to drain making certain that no water remains in the deflector tubes. Shake excess water from the facepiece and permit it to air-dry. When rubber portions of the facepiece have dried, use a soft, dry cloth to absorb any moisture still clinging to the surfaces of the voicemitter-outlet valve assembly. If the disks in the nosecup valve become detached while the facepiece is being cleaned, they must be replaced.

b. Carrier. Empty the carrier pockets (par. 9*c*) ; brush the carrier both inside and outside to remove superficial dirt. Proceed with cleaning as described in paragraph 19.

36. Head Harness

a. Remove the old head harness by releasing the straps from the buckles of clip-and-buckle assemblies.

b. Place a new head harness in the facepiece so that the straps and head pad are in proper position.

c. Thread the ends of the head harness straps through the buckles of the clip-and-buckle assemblies by inserting the clinch tips at an angle. (The tips are wider than the buckle openings.) Pass each strap through its buckle from beneath the buckle and through the opening nearest the facepiece; then pass the strap over the buckle bar and through the other opening.

d. Pull the straps through the buckles so that the ends of the straps extend about 1 inch past the buckles.

e. Refit mask to user (par. 16).

37. Inlet Valve Assembly

a. Remove the inlet valve assembly from the facepiece (par. 34*a*).

b. Attach the valve disk to a replacement assembly by carefully fitting the hole in the center of the disk over the stud on the back of the inlet cap.

c. Attach the replacement inlet valve assembly to the connector of the filter element assembly (par. 34*f*).

38. Flap Buttons

Replace the flap buttons if they are either damaged or missing.

a. If the buttons are damaged, remove them from the mask by lifting the nosecup and the flap off the buttons. Then grasp the bottom of each button and pull it through its hole in the lip of the pouch. Always pull a button through its hole *into* the pouch; never attempt to pull a button from its hole in the opposite direction because the base of a button is larger than its head.

b. When the damaged buttons have been removed, first replace the short button in the hole nearest the outer edge of the mash. Using the finger to support the bottom of the button, force the button through its hole in such a manner that the base of the button is inside the pouch and the head protrudes into the cavity of the mask. In like manner, replace the long button in the hole nearest the nosecup.

c. Button the flap of the pouch and fasten down the nosecup as instructed in paragraph 34*e*(3).

39. Valve Disks

a. Inlet Valves.

(1) Remove the inlet valve assemblies from their connectors (par. 34*a*). Lay the assemblies on a flat, clean surface with the flocked outside surface down. Pass a finger lightly over each disk from the circumference toward the stud on which the disk is held, thus raising the edge of the disk. Grasp the edge of the disk between the thumb and finger and pull it from the stud by stretching the disk slightly, thus enlarging the center hole.

(2) With the fingers of both hands, grasp a replacement disk at opposite sides of its circumference and stretch the disk slightly. Lower the disk to the stud and slip it over the stud. Smooth out with a finger any pucker that appears around the stud or at the circumference of the disk. The disk must lie flat on its seat completely covering the holes in the filter element cap.

(3) Repeat the procedure with the second inlet valve assembly and replace both assemblies on the mask (par. 34*f*).

b. Nosecup Valves.

(1) Reverse the head harness (par. 34*b*) to permit free access to the interior of the mask. Curl back the soft lip of one side of the nosecup, more fully exposing the nosecup valve and facilitating removal of the disk. With a fingernail, raise the edge of the disk from the cup of the valve in which it is seated. Lift the edge of the disk with the forefinger and thumb and gently pull away from the stud, thus enlarging the hole in the disk sufficiently to remove the disk from the stud.

(2) Holding the replacement disk between the forefinger and thumb, place the hole in the disk over the stud so that one portion of the circumference of the hole slips over the head of the stud. Gently pull the opposite side of the disk to stretch the hole so that it will pass completely over the head of the stud. Press the disk down over the valve seat so that it lies flat and can function properly.

(3) Repeat the procedure with the other nosecup valve disk.

40. Carrier

a. Inspect the replacement carrier to be sure that it is clean inside and out. Pass the hand over all inside surfaces to detect any imperfections that might possibly damage the mask.

b. Remove the M5A2 chemical warfare agents protection and treatment set and the M1 antidim set from their respective pockets (par. 9*c*) in the old carrier and put them into their pockets in the replacement carrier.

c. Place the mask in the replacement carrier with the lower portion of the mask resting on the wider edge of the carrier, the nose toward the carrier flap.

d. Fasten the flap of the carrier.

41. Eyepieces

a. Removal.

(1) Insert the eyering hook tool under each tab of the eyering and bend the tab until contact is broken with the rubber of the facepiece (fig. 18).

(2) Lift off the eyering and remove the lens from the molded eyepiece socket.

Note. Two eyering hook tools are contained in every M1A1 Chemical Corps equipment maintenance and repair set. The M1A1 maintenance and repair set is available at fourth echelon shops (SM 3–4–4970–A17).

Figure 18. Bending tabs of eyering with eyering hook tool.

b. Replacement.

(1) Insert a new lens in the eyepiece socket alining the checkpoints on the faceblank and lens.

(2) Place a *new* eyering over the lens and aline the checkpoints on the eyering with the checkpoints on the lens and faceblank.

(3) Use eyepiece crimping pliers to crimp two tabs at opposite sides of the eyering.

(4) Check alinement of checkpoints on the eyering, lens, and faceblank. If all checkpoints are correctly alined, crimp all tabs of the eyering. Take care not to damage the faceblank or the protective coating of the eyering. Be sure that no rubber shows between the eyering and the lens.

(5) Test the mask for leakage using the M2 eyepiece leakage indicator.

42. Pinhole Defects

Send masks with pinhole defects for repair (par. 31*b*). Attach DA Form 9–81 to the harness of the mask to describe the nature of the defect. Cover the pinhole or other defect with a small piece of masking tape to locate the area requiring repair.

***Caution:* Do not indicate the location of the defect by marking the mask with paint, crayon, indelible pencil, or other means which cannot be readily cleaned from the mask.**

43. Temple Pins

a. General. Should either temple pin (par. 6*i*) be lost or damaged, it must be replaced by a specially requisitioned replacement (TM 3–4240–202–15P) ; a part obtained from salvage will not be satisfactory. As issued, the temple pin has a shaft extending beyond one of the end knobs of the pin. This shaft, slightly smaller in diameter than the shaft between the two knobs, is provided solely as a means of threading the body of the pin through the holes of the retaining lugs.

b. Installation.

(1) If a portion of a damaged temple pin remains in position between the lugs, it must be removed. Cut the shaft of the damaged pin and withdraw the separated sections.

(2) Lubricate the replacement temple pin by wetting it with water. Starting either from above or below the two lugs molded in the faceblank, thread the thin shaft of the pin through the hole in the nearest lug. Grasp the protruding portion of the shaft and pull one knob of the pin through the hole. Then thread the shaft through the second hole and pull the knob through that hole as well.

(3) Cut off the portion of shaft that extends beyond the lug.

44. Voicemitter-Outlet Valve Assembly

a. General. When the voicemitter-outlet valve frame (5, fig. 3) is damaged, the complete assembly (frame, gasket, diaphragm, sealing ring, and outlet valve disk) must be replaced. Whenever the voicemitter-outlet valve frame is removed from the facepiece, the crimping ring must be replaced. Never secure a new voicemitter-outlet valve assembly to the facepiece with a used crimping ring.

b. Removal and Replacement of Complete Assembly.

(1) Using an eyering hook tool, bend back each of the tabs of the crimping ring (6) to release the voicemitter-outlet valve frame from the facepiece.

(2) Lift the frame from the mask and discard the entire assembly (*a* above).

***Caution:* During this operation, do not disturb the relative positions of the flange at the forward end of the nosecup (17) and the flange molded around the opening in the faceblank. (The crimping ring, in addition to fastening the voicemitter-outlet valve assembly to the facepiece, also holds the nosecup in position in the mask.)**

Note. It is suggested that fourth echelon personnel fabricate a jig which will maintain the nosecup and facepiece flanges in their correct relative positions. No such device is issued with the mask.

(3) Compress the facepiece in the area of the voicemitter-outlet valve opening to permit removal of the crimping ring, the flange of which is lodged beneath the rubber flange molded in the faceblank. Discard the old crimping ring because the tabs of the ring have probably been weakened in raising them from the voicemitter-outlet valve frame.

(4) Keep the facepiece compressed and position a new crimping ring on the facepiece. Release pressure and make sure that there are no bulges either in the flange of the facepiece or of the nosecup (see *caution* above) as they lie on the flange of the crimping ring.

(5) Move the crimping ring into the exact assembly position on the mask. Correct position is achieved when the eighth notch between tabs, counting from either of the lugs on the sides of the crimping ring, is in alinement with the mold mark under the chin of the mask.

(6) Lay a new voicemitter-outlet valve assembly on the rubber flange encircled by the crimping ring. Make sure that the assembly is correctly alined within the crimping ring.

(7) Carefully maintaining the correct relative positions of faceblank, nosecup, voicemitter-outlet valve frame, and crimping ring, crimp tight the tabs of the crimping ring with the bent-nose slip-joint pliers from the M1A1 repair set. Alternately crimp tabs on opposite sides of the crimping ring until all tabs are crimped tight.

(8) Test the mask for leakage.

c. Replacement of Outlet Valve Disk. The outlet valve disk will be replaced without removal of the voicemitter-outlet valve assembly from the mask whenever visual examination or leakage tests reveal that the disk is imperfect. Replace the disk in the following steps:

(1) Remove the rubber voicemitter-outlet valve cover.

(2) Pinch the outlet valve disk between the thumb and forefinger and pull it from the outlet valve seat. Discard the disc.

(2) From the front of the mask, thread the stem of a new outlet valve disk through the hole in the middle of the outlet valve seat. Hold the disk in this position while reaching inside the mask with the other hand to grasp the end of the stem threaded through the valve seat.

(4) Pull the stem of the disk into the mask until the shoulder on the stem slips through the hole in the valve seat, thus holding the disk in position on the valve seat.

(5) Cut off the excess length of valve stem close to the shoulder.

(6) Replace the voicemitter-outlet valve cover.

d. Equipment Necessary for Replacement of Voicemitter Diaphragm. Two items not issued

with the mask are required for removal of a damaged voicemitter diaphragm and for replacement of a new diaphragm. (This replacement can be made without removing the frame from the facepiece.)

(1) A jig (fig. 19) is necessary to hold the mask in position for removal of the voicemitter diaphragm while it is tapped free of the voicemitter frame.

(2) A cylindrical or half-round block of metal having a diameter slightly less than the inside diameter of the housing of the diaphragm in the voicemitter frame is also required.

(3) These items must be fabricated by fourth echelon personnel.

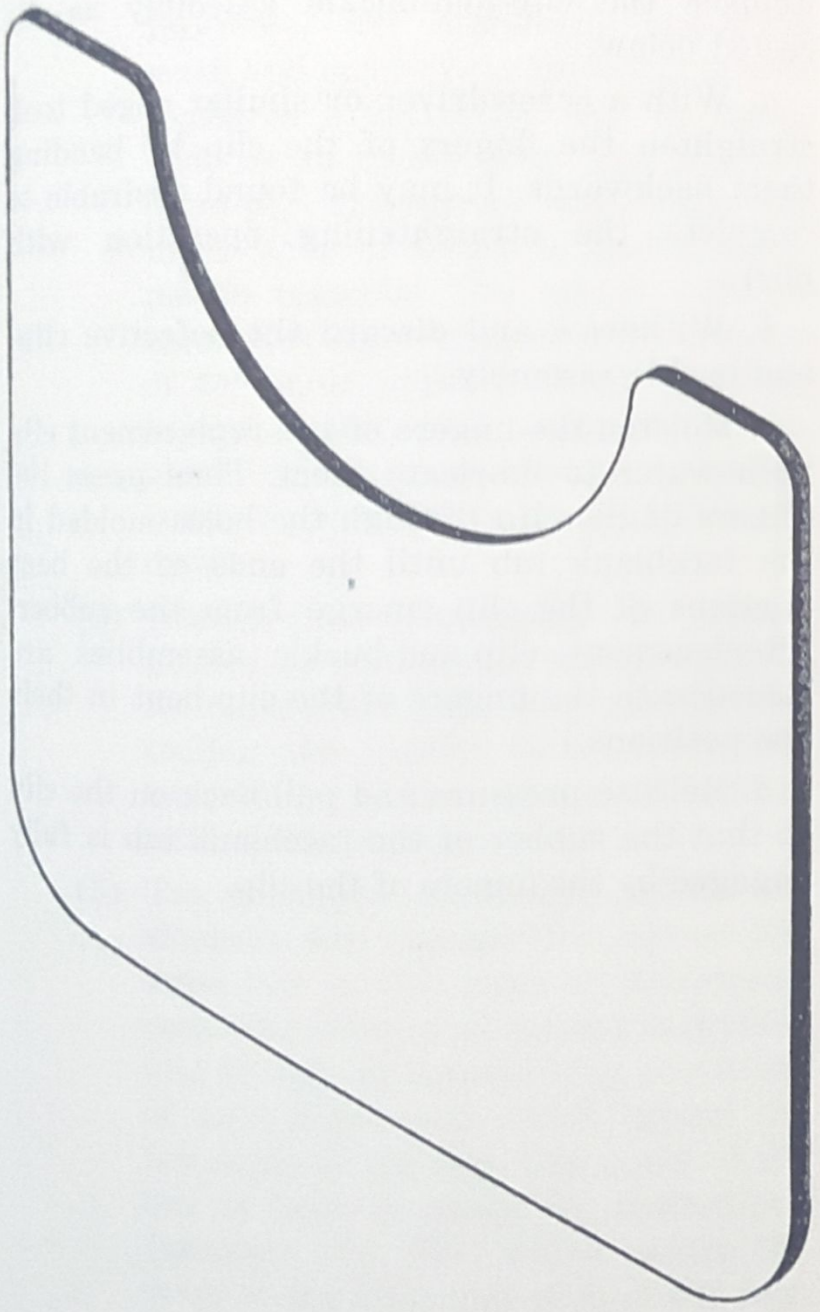


Figure 19. Jig.

e. Removal and Replacement of Voicemitter Diaphragm.

(1) Hold the lower (straight) end of the steel jig (fig. 19) tight in the jaws of a vise so that the slot is uppermost.

(2) With the voicemitter-outlet valve cover removed, invert the mask so that the chin portion is uppermost and the inside of the mask is facing the operator.

(3) Position the mask in the jig slot so that the sides of the slot fit around the receptacle holding the diaphragm in the frame. The edges of the jig are flush against the tabs of the crimping ring and beneath the flange of the sealing ring.

(4) Place one end of the metal block (*d*(2) above) against the surface of the diaphragm inside the mask (the surface facing the operator). Hold the block so that pressure is exerted only against the lower portion of the diaphragm, where the frame is supported by the jig.

(5) Tap the other end of the block with a hammer so that the impact of the blow is transmitted to the lower edge of the diaphragm. This impact forces the sealing ring from the frame, thus releasing the diaphragm and the gasket.

(6) Discard the old diaphragm and the gasket.

(7) To replace the diaphragm, lift the mask from the jig and turn it around so that the outside of the mask is now facing the operator. Lower the mask onto the jig again so that the jig fits around the frame between the rubber of the facepiece and the crimping ring.

(8) Seat the new gasket in its housing in the voicemitter frame and then seat the new voicemitter diaphragm on the gasket. Hold the diaphragm and gasket in place by pressing gently with the fingers.

(9) Slip the rim of the sealing ring over the upper portion (nearest the outlet valve) of the diaphragm housing in the frame. Tilt the sealing ring a little so that the upper portion of the ring engages the frame.

(10) Place one end of the block (*d*(2) above) against the flat surface of the

sealing ring, beneath the bead on top of the ring. Tap the other end of the block with a hammer to snap the sealing ring into place.

***Caution:* Do not tap the bead of the sealing ring when snapping the ring into place. Sharp pressure on this bead may close the channel beneath it, thus preventing proper fitting of the rubber voicemitter assembly cover around the sealing ring.**

(11) Replace the voicemitter-outlet valve cover.

45. Nosecup Assembly

Remove and replace the nosecup assembly when the rubber of the nosecup becomes cracked, stiff, permanently deformed, or physically damaged; or when the seal between either nosecup valve (19, fig. 3) and the rubber becomes defective.

a. Loosen the crimping ring and remove the voicemitter-outlet valve assembly and the crimping ring (par. 44*b*(1)–(3)).

b. Discard the voicemitter-outlet valve assembly and crimping ring.

c. Reach into the mask and pull out the old nosecup assembly.

d. Hold a replacement nosecup assembly in one hand and insert it in the mask in general alinement with its intended position in the mask. Pass the flange at the forward end of the nosecup through the voicemitter opening in the faceblank.

e. Adjust the position of the nosecup with relation to the faceblank and smooth the flange of the nosecup on top of the flange molded around the voicemitter opening to remove wrinkles or bulges and to insure uniform contact of the two rubber flanges at all points.

f. Position the crimping ring under the faceblank flange (par. 44*b*(4) and (5)).

g. Complete reassembly (par. 44*b*(6) and (7)) using a new voicemitter-outlet valve assembly and crimping ring.

46. Clip-and-Buckle Assemblies

Should a clip-and-buckle assembly (4, fig. 5) become damaged to the extent that a strap of the head harness cannot be attached and properly adjusted (par. 16), replace the clip-and-buckle assembly. If the rubber tab (3) is damaged, do not install a new clip-and-buckle assembly. Instead, turn in the mask for salvage. Replace the clip-and-buckle assembly as directed below.

a. With a screwdriver or similar edged tool, straighten the fingers of the clip by bending them backwards. It may be found desirable to complete the straightening operation with pliers.

b. Withdraw and discard the defective clip-and-buckle assembly.

c. Moisten the fingers of the replacement clip with water to lubricate them. Then press the fingers of the clip through the holes molded in the faceblank tab until the ends of the bent portions of the clip emerge from the rubber. (Replacement clip-and-buckle assemblies are issued with the fingers of the clip bent in their use positions.)

d. Release pressure and pull back on the clip so that the rubber of the faceblank tab is fully engaged by the fingers of the clip.

SECTION IX

SHIPMENT AND LIMITED STORAGE AND DESTRUCTION TO PREVENT ENEMY USE

47. Shipment

a. Complete Masks.

(1) Each M17 field protective mask, complete with filter elements, is individually packaged for shipment. Deformation of the mask in shipment and storage is prevented by a fiberboard faceform which is inserted inside the facepiece. The completely assembled mask and supporting faceform is heat sealed in a protective bag 12 inches wide by 15 inches deep. The bag is a three-ply vaporproof container, the inner layer of which is heat sealable plastic material. The middle layer is metal foil, and the outer layer consists of fabric or paper backing. The bag is heat sealed under controlled atmospheric conditions so that no moisture-laden air is sealed in the bag with the mask.

(2) Intermediate packaging is accomplished by placing the mask, sealed in its vaporproof bag, in a carrier and sealing the carrier in a waterproof bag, similar to the vaporproof bag but lacking the layer of metal foil.

(3) Ten packaged masks are packed for shipment and storage in a cleated plywood box in two rows of five masks each. The interior of the box is divided into 10 cells by interlocking partitions of solid fiberboard which extend the full depth of the box. The cover of the box is held in place by cleated-box fasteners (fig. 20), which secure the cover to the sides and ends of the box. Two fasteners are used on each side and one at each end.

(4) Neither the shipping box nor the fasteners are to be discarded when the masks are unpacked by the organization to which they are issued. The box itself is used for storage by the using unit (par. 48), and the top and fasteners are laid aside for reuse if it becomes necessary to reship the masks in the boxes. To insure availability of the box for storage purposes and for possible reuse, a note to save the box for unit storage of masks is stenciled on the inside of the cover of the box.

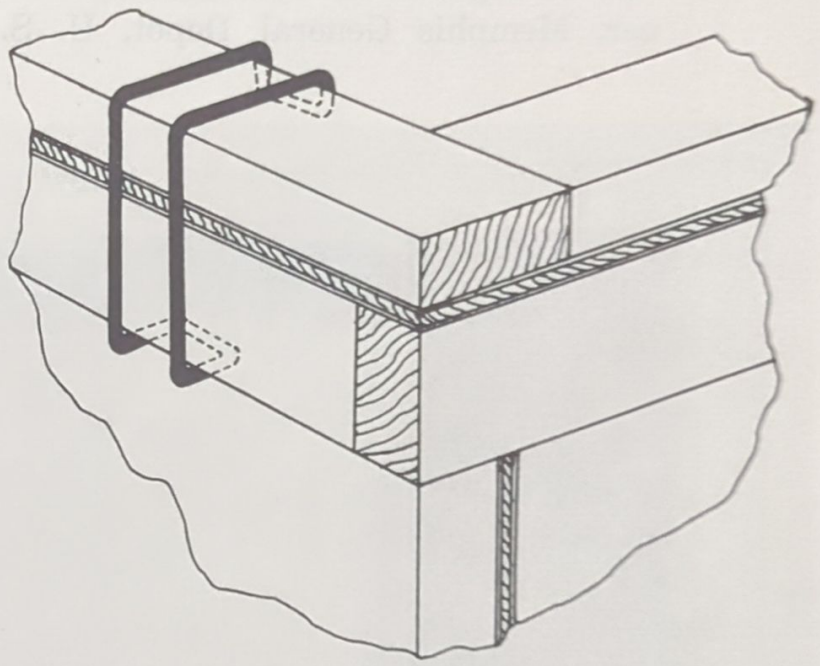


Figure 20. Cleated-box fastener in place.

b. Replacement Filter Element Assemblies.

(1) Replacement filter element assemblies are packaged for shipment in pairs (one right-cheek and one left-cheek element in a heat-sealed protective bag of the type described in *a*(1) above). Each bag is approximately 9 by 9 inches in size. Bags are sealed under controlled atmospheric conditions to prevent the inclusion of moisture-laden air in the bag.

(2) Ten sealed bags are further packaged in a sealed and taped fiberboard box, having inside dimensions of 6½ by 4¾ by 18½ inches.

(3) Ten intermediate packages (100 pairs of filter elements) are packed for shipment in a sealed and strapped fiberboard box, having inside dimensions of 19 by 13½ by 25 inches.

48. Limited Storage

a. Station Storage. Store stocks of masks and replacement filter element assemblies in the boxes in which they are received, protected from sun, rain, and dampness.

b. Storage by Individual or Using Unit.

(1) When a new mask is issued to an individual, the faceforms will be retained in unit supply rooms, as are those for the M9 series masks, and turned in to a central storage area. Accumulations of 300 or more serviceable faceforms will be reported to Commanding Officer, Memphis General Depot, U. S. Army, Memphis 15, Tenn., ATTN: Chemical Supply Officer. The protective bags may be discarded or put to such secondary use as may be approved by the organizational commander concerned.

(2) The boxes in which masks are shipped are designed to be used also for unit storage of masks. For such storage purposes, the cleated tops are removed from the boxes, and the boxes are stacked on their sides to form a bank of storage cells. The boxes may be stacked in tiers and arranged like library book stacks. Each storage cell can be marked (par. 9*d*) to designate the individual whose mask is to be stored in it (fig. 21). When the unit displaces, masks may be carried by the individual soldier or may be moved to the new location in the storage

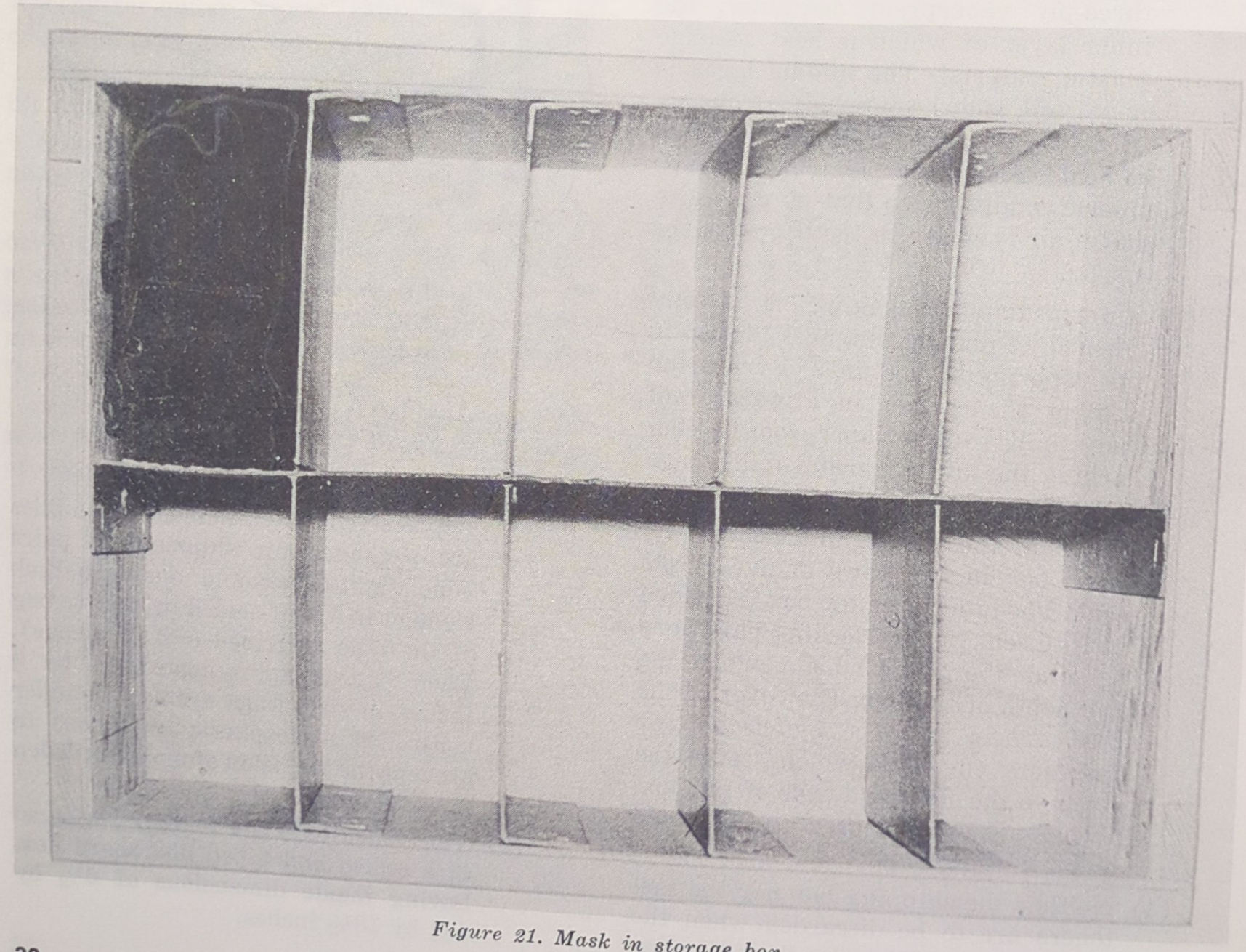


Figure 21. Mask in storage box.

boxes. It is a command decision as to which course of action is prescribed.

49. Destruction To Prevent Enemy Use

a. General. Masks issued to individuals will not be destroyed. When capture or abandonment of stocks of masks to the enemy is imminent, the responsible commander makes the decision to destroy the masks or render them ineffective. Orders are then issued which cover the specified method of destruction. All masks will be destroyed by the same method.

b. Destruction by Mechanical Means. Use any tools which may be available, such as picks, axes, or knives to destroy metal and plastic components and to slash or puncture rubber components and carriers.

c. Destruction by Burning. Gather masks in a pile, saturate the pile with gasoline or other petroleum fuel, and ignite.

APPENDIX I

REFERENCES

AR 40–117	Spectacles.
AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.
AR 746–10	Marking Personal Clothing and Organizational Clothing and Equipment.
AR 750–8	Command Maintenance Inspections.
DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings.
DA Pam 310–1	Index of Administrative Publications.
DA Pam 310–3	Index of Training Publications.
DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
FM 3–60	Chemical Maintenance Company.
FM 21–5	Military Training.
FM 21–6	Techniques of Military Instruction.
FM 21–15	Care and Use of Individual Clothing and Equipment.
FM 21–30	Military Symbols.
FM 21–40	Small Unit Procedures in Atomic, Biological, and Chemical Warfare.
FM 21–41	Soldier's Handbook for Nuclear, Biological, and Chemical Warfare.
FM 21–48	CBR Training Exercises.
TM 3–220	Decontamination.
TM 3–304	Protective Clothing and Accessories.
TM 3–4240–202–15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists for Mask, Field, Protective, M17.
TM 8–285	Treatment of Chemical Warfare Casualties.
SM 3–4–4940–A17	Maintenance and Repair Set, Chemical Corps Equipment, M1A1.

APPENDIX II

MAINTENANCE ALLOCATION CHART

Mask, Protective, Field, M17

Date of Preparation: July 1958

1. Explanation of Columns

a. Column 1, Reference Number. Column 1 lists reference numbers the purpose of which is to identify components, assemblies, and subassemblies with the next higher assembly. Reference numbers are assigned in multiples of 100 in sequence to components or assemblies listed in column 2, beginning with reference number 100 for the first component or assembly, 200 for the second, and so on. Subassemblies of the first component or assembly are numbered in sequence from 101 to 199; subassemblies of the second assembly, 201 to 299; and so on. Parts of subassemblies are numbered in sequence by a decimal following the number of the subassembly. For example, the third maintainable part of a subassembly numbered 102 would be numbered 102.3.

b. Column 2, Component and Related Maintenance Operations. Column 2 lists components, assemblies, subassemblies, and parts on which maintenance can be performed; and the maintenance operations which are authorized to be performed on each.

c. Columns 3, 4, 5, 6, and 7, Maintenance Echelon. The letter "X" in these columns indicates the lowest echelon authorized to perform the prescribed maintenance operation.

d. Column 8, Remarks. Column 8 is used for special instructions.

2. Use of Chart

The Maintenance Allocation Chart will be used in conjunction with this manual. Determine from the chart the echelon that is authorized to perform the required maintenance operation. Refer to the text in the appropriate part of the manual for instructions in performing the authorized maintenance operations defined below.

SERVICE	To clean, to preserve, and to replenish fuel and lubricants.
ADJUST	To regulate periodically to prevent malfunction.
INSPECT	To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.
TEST	To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.
REPLACE	To substitute serviceable assemblies, subassemblies, and parts for unserviceable component parts.
REPAIR	To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.
ALINE	To adjust two or more components of an electrical system so that their functions are properly synchronized.
CALIBRATE	To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.
OVERHAUL	To restore to a completely serviceable condition by disassembling assemblies and subassemblies, by inspecting, replacing parts, and by necessary boring, grinding, or machining operations, followed by reassembly and final inspection.
SYMBOL "X"	The symbol "X" placed in the appropriate column indicates the echelon responsible for performing that particular maintenance operation, but does not necessar-

ily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by "X" are authorized to perform the indicated operation.

SYMBOL "%%" The symbol "%%" indicates that second echelon personnel may perform the particular maintenance operation provided the request originates from organizational level and is specifically authorized by the direct support technical service officer. In no case will performance of a "double percent" operation be directed by the direct support technical service officer, and in no case will a "double percent" operation authorize stockage of parts at organizational level.

Maintenance Allocation Chart
for
Mask, Protective, Field, M17

(1) Reference No.	(2) Component and related maintenance operations	Maintenance echelon (3) 1st	(4) 2d	(5) 3d	(6) 4th	(7) 5th	(8) Remarks
100	Outsert, Eyelens, M1.						
	Replace		X				
200	Set, Antidim, M1.						
	Replace		X				
300	Facepiece group.						
	Service	X					
	Inspect	X					
	Test				X		
	Repair				X		
301	Buttons, flap.						
	Replace		X				
302	Cap, inlet valve.						
	Replace		X				
303	Clip and buckle.						
	Replace			X			
304	Cover, Voicemitter, C13.						
	Replace		X				
305	Disk, nosecup and inlet valve.						
	Replace		X				
306	Filter Element, M13.						
	Replace		X				
307	Head harness.						
	Replace		X				
308	Pin, temple.						
	Replace			X			
400	Carrier group.						
	Replace		X				
	Repair				X		

APPENDIX III

BASIC ISSUE ITEMS LIST

1. Purpose and Scope

This appendix furnishes the user of the M17 field protective mask with a list of the major components that comprise the end item.

2. Explanation of Columns

a. Federal Stock Number. Federal stock numbers are assigned by the Federal Cataloging Program and are to be used in accordance with AR 708–15.

b. Description. The approved Federal item name appears in upper case (capital) letters. Modifiers necessary for proper identification appear in lower case (small) letters.

c. Unit of Issue. The unit of issue for each item is indicated in this column.

d. Expendability. The symbol NX indicates that an item is nonexpendable. When no symbol appears, the item is expendable.

e. Quantity Authorized. Quantities listed represent the assemblies, accessories, and attachments which constitute the end item, and include repair parts, spare assemblies, supplies, and special tools if authorized for first echelon maintenance. The authorized quantities for each end item must be on hand or on order at all times.

3. Abbreviations

The abbreviations used herein are defined as follows:

ea	each
se	set

4. Suggestions and Recommendations

Notice of discrepancies or suggested changes are requested and encouraged. They should be forwarded through command channels on DA Form 2028 to the Commanding Officer, U. S. Army Chemical Corps Engineering Command, Army Chemical Center, Md., ATTN: CMLEN–WSM–P.

Federal stock No.	Description	Unit of issue	Expendability	Quantity authorized
	MASK, PROTECTIVE, FIELD, M17, SMALL	ea	NX	
4240–542–4450	MASK, PROTECTIVE, FIELD, M17, MEDIUM	ea	NX	
4240–542–4451	MASK, PROTECTIVE, FIELD, M17, LARGE	ea	NX	
4240–542–4452				
	MAJOR COMPONENTS			
	FACEPIECE	ea		1
	CAP, INLET VALVE, C20	ea		2
4240–678–0730	FILTER ELEMENT, M13, 1 - right, 1 - left	se		1
4240–678–8474	OUTSERT, EYELENS, M1	ea		2
4240–678–0731	CARRIER, FIELD, PROTECTIVE MASK, M15	ea		1
4240–591–5151	SET, ANTIDIM, M1	ea		1
4240–127–7193				
	REPAIR PARTS			
	None			

[(G 470.72 (21 Sep 59)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

CNGB (1)
Tech Stf, DA (1) except
  CCm10 (10)
  CofEngrs (5)
Tech Stf Bd (2)
USCONARC (10)
Army Maint Bd (2)
USA Arty Bd (2)
USA Armor Bd (2)
USA Inf Bd (2)
USA AD Bd (2)
USA Abn & Elct Bd (2)
USA Avn Bd (2)
US ARADCOM (5)
US ARADCOM Rgn (5)
OS Maj Comd (5)
MDW (1)
Armies (3) except
  First USA (5)
Corps (3)
Div (3)
Regt/Gp/bg (3)
Bn (3)
Co/Btry (3)
CmlCEncom (25)
CmlC Tng Comd (5)
CmlCMatCom (20)
USMA (10)
Svc Colleges (10)
Br Svc Sch (2) except
  USACMLSCH (50)
PMST Sr Div Units (1)
PMST Mil Sch Div Units (1)
GENDEP (5)
Cml Sec, GENDEP (5)
Cml dep (5)
Ports of Emb (OS) (1)
Trans Terminal Comd (2)
Army Terminals (2)
OS Sup Agcy (1)
PG (5)
Cml Arsenals (3)
Raritan Arsenal (2)
Mil Dist (1)
USA Corps (Res) (1)
Sector Comd, USA Corps (Res) (1)
Cml Proc Dist (3)

NG: None.

USAR: Same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320–50.

☆ U. S. Government Printing Office: 1959—520504